

AD-A078 943

ARMY TROOP SUPPORT AGENCY FORT LEE VA DIRECTORATE OF--ETC F/G 6/8  
INGREDIENT PREPARATION ACTIVITY.(U)

SEP 79

UNCLASSIFIED

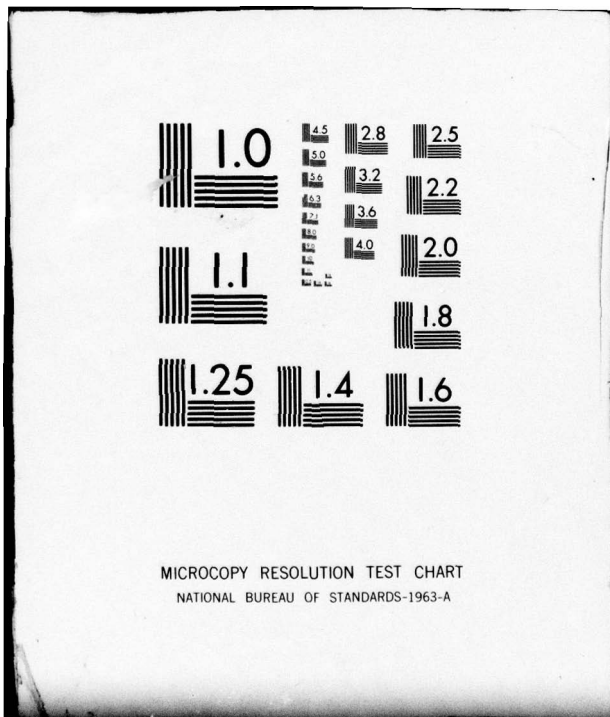
CS-SD-7903

NL

1 OF 3  
AD-  
A078943









LEVEL 11

CS-SD-7903

9

EVALUATION REPORT.

Jan-Apr 79,

1

AD A 078943

6

INGREDIENT  
PREPARATION ACTIVITY.



Troop Support Agency  
Directorate of Concepts and Systems  
Fort Lee, Virginia

12239

11

Sep 1979

DDC  
RECEIVED  
DEC 28 1979  
A

DISTRIBUTION STATEMENT A

Approved for public release  
Distribution Unlimited

79 13 11 075

DDC FILE COPY



ABSTRACT

The evaluation of the Central Food Preparation System (CFPS) at Fort Lee, Virginia was conducted in 1978 by the US Army Troop Support Agency (TSA), US Army Natick Research and Development Command (NARADCOM), and Fort Lee. The report of this evaluation was published in December 1978 as TSA Report CS-SD-7901 and approved by the Department of the Army. Included in this report was the recommendation to separately evaluate the Ingredient Preparation Activity (IPA) part of the CFPS as a potential command option. The evaluation of the Fort Lee IPA was completed during the first half of 1979. It was determined that the concept of centrally processed potatoes, salad vegetables, gelatin salads, sliced bacon, formed ground meats and sliced/diced meats and cheeses is effective and well accepted by customers and dining facility managers. The IPA activity was not cost effective for the installations surveyed and there is concern over potential reduction of cook's skills. The report is provided MACOMs for information, but establishment of IPA must be based on separate cost analysis at any installation considering establishment of an IPA.

Accession For	
NTIS G.M&I	
DDC TAB	
Unannounced	
Justification	
<i>File on file</i>	
By	
Distribution/	
Availability Codes	
Dist.	Avail and/or special
<i>A</i>	

DISTRIBUTION STATEMENT A  
Approved for public release;  
Distribution Unlimited



## TABLE OF CONTENTS

	<u>PAGE</u>
SECTION I INTRODUCTION	1
A. PURPOSE	1
B. SCOPE	1
C. RESPONSIBILITIES	1
D. BACKGROUND	2
E. OBJECTIVE	3
SECTION II SYSTEM DESCRIPTION	5
A. MANAGEMENT STRUCTURE	5
B. FACILITY	5
C. PRODUCTION	6
D. INGREDIENTS	6
SECTION III EVALUATION FINDINGS/RESULTS	9
A. IPA OPERATIONS AND PRODUCTION	9
B. FACILITY AND EQUIPMENT	18
C. ACCOUNTING AND FINANCIAL	20
D. QUALITY CONTROL/QUALITY ASSURANCE	21
E. ACCEPTANCE OF IPA PRODUCTS	24
F. FOOD SERVICE AND COMMANDER ATTITUDES	25
G. STAFFING AND TRAINING	26
H. ORGANIZATIONAL STRUCTURE	31
I. EXPANSION AND MOBILIZATION CAPABILITIES	32
J. FIELD FEEDING INTERFACE	33
K. ECONOMIC/COST ANALYSIS	34



TABLE OF CONTENTS (Cont'd)

		<u>PAGE</u>
SECTION IV	SUMMARY	39
SECTION V	CONCLUSIONS	43
SECTION VI	RECOMMENDATIONS	45

ANNEXES

A	CONCEPT OF OPERATIONS AND PROCEDURES
B	USER/OPERATOR EVALUATION
C	ANALYSIS OF OPERATIONS
D	EQUIPMENT USAGE
E	VETERINARY STAFF OFFICE EVALUATION
F	INGREDIENT PREPARATION ACTIVITY AT KEESLER AFB, BILOXI, MISSISSIPPI
G	DINING FACILITY PERSONNEL ATTITUDES AND SKILL LEVELS
H	WORK SAMPLING DATA COLLECTION
I	ECONOMIC ANALYSIS OF THE INGREDIENT PREPARATION ACTIVITY CONCEPT



## SECTION I

### INTRODUCTION

✓  
A. PURPOSE: The Ingredient Preparation Activity (IPA), formerly a branch of the Central Food Preparation System (CFPS) at Fort Lee, Virginia, was evaluated separately and subsequently to the CFPS evaluation to ascertain the practicality and potential for an autonomous IPA operation. The TRADOC and Fort Lee, as the operators of the CFPS, perceived the IPA as an efficient, cost effective, well received, and highly desirable activity. These characteristics suggested that the IPA should be further analyzed for possible adoption, on a command option basis, as a means for improving the cost effectiveness, quality, and responsiveness of an installation's food service program.

B. SCOPE: The IPA evaluation was conducted during the period January through April 1979 according to the guidelines set forth in the US Army Troop Support Agency Evaluation Plan, Ingredient Preparation Activity, Fort Lee, Virginia, dated 14 February 1979. The evaluation encompassed an economic/cost analysis staffing requirements, operational aspects, personnel attitudes, quality assurance/quality control, field feeding interface, expansion and mobilization capabilities, and organization/management requirements. ↗

C. RESPONSIBILITIES: Organizations responsible for the IPA evaluation program were the Troop Support Agency (TSA), technical director of the overall evaluation and coordinator between NARADCOM and Fort Lee in related matters; Natick Research and Development Command (NARADCOM), technical advisor and engineering support from the RDT & Eng Program; Fort Lee, operator and user/evaluator; and the Surgeon General, adherence to public health standards.

- 1 -



D. BACKGROUND: In November 1970, the Chief of Staff of the Army established the DA Subsistence Operations Review Board (SORB) to investigate the adequacy of the Army food service system and to develop an effective, efficient, and economical system. The board observed that many of the deficiencies were caused by the use of small, inefficient, and independent food preparation facilities. These facilities were operated, in many cases, by unqualified personnel with minimal supervision.

Natick Laboratories tested the Central Food Preparation concept at Fort Lewis, Washington, where these initial studies indicated that a Central Food Preparation Facility (CFPF) would be cost effective, reduce manpower requirements, and increase customer acceptance. The Ingredient Preparation Activity was an element of the CFPF. Separate ingredient preparation and scaling operations existed at Walter Reed Medical Center and Fort Lee in 1971. In 1973, Army officials advised the Investigative Staff for the Committee on Appropriations, US House of Representatives, on the Department of the Army FY 74 Military Construction Program that in order to further evaluate the CFPF Concept as tested at Fort Lewis, the Army was installing an interim CFPF system at Fort Lee, Virginia.

One of the primary differences between the interim CFPF and the original CFPF concept design was that the IPA was housed in a separate building about 200 yards from the Fort Lee Central Kitchen (CK). The Ingredient Preparation Activity in Building 7118 began operation in April 1975 and has operated continuously since that date. The Ingredient Preparation Activity was to function initially in a limited capacity for central salad and potato preparation in direct support of dining facilities until such time as



full-scale operations were required to support the Central Kitchen (CK). Initial processing included potatoes, vegetables, and gelatin salads, with additional items added as time progressed, including meatballs, meat and veal loafs, and Salisbury steak. All items were sent fresh to dining facilities. Concurrent with the opening of the CK in late 1977, other functions were added, including processing of meats and vegetables for cooking in the CK and weighing and scaling of ingredients for CK products. Based on the evaluation of the CFPF concept in 1978, the Army determined that the CFPF should not be proliferated Armywide. The CK was closed in March 1979 and IPA support of the CK terminated.

Since the IPA and CK were located in different facilities, some separate data collection for the IPA was accomplished during the CFPF evaluation. Based on this data, data collected on ingredient preparation types of items prior to the CFPF operation, and further data collected during January - May 1979, a determination was to be made concerning the advisability and potentialities of this type of operation for other Army installations.

E. OBJECTIVE: The overall objective of the evaluation program was to determine if the IPA was a viable concept for implementation at other installations, in whole or part, as a command option. To achieve this objective, the following were accomplished:

1. A cost/economic analysis was conducted.
2. Staffing requirements were determined for IPA's according to the sizes of the troop populations served.
3. Quality control/quality assurance requirements relating to policies, procedures, personnel, laboratory facilities, and inspection criteria were determined.



4. Operational practices of the IPA were analyzed, including its production criteria and equipment, design, and operational requirements.

5. Recommended location for an IPA in the installation food management structure was determined.

6. Visits were made to Keesler Air Force Base to observe and analyze the operation of the CFPF, which included production of IPA types of items.

7. Results of the CFPS evaluation were used to address the following:

a. Acceptance of IPA's centrally processed foods by the consumer/dining facility manager.

b. Command and food service personnel attitudes toward the IPA concept. Additional questionnaires related to the IPA were completed separately by dining facility managers.

c. The impact of the IPA on mobilization and expansion capabilities.

d. Interface of the IPA with installation field feeding requirements.



## SECTION II

### SYSTEM DESCRIPTION

A. MANAGEMENT STRUCTURE: Until April 1979, the Fort Lee Food Program was controlled by a central manager who was responsible for management of the corporate Fort Lee TDA and TOE dining facilities which included food service personnel. This Director of Food Management also supervised and managed the Central Food Preparation Facility and Troop Issue Subsistence Activity. The Fort Lee Ingredient Preparation Activity (IPA) was originally a part of the Central Food Preparation Division under the Director of Food Management. After closure of the CFPF in March 1979, the Fort Lee Food Program reverted to a decentralized management structure. Dining facility operational responsibility was assigned to the Quartermaster Brigade. The Installation Food Adviser, TISA, and Ingredient Preparation functions were transferred to the Director of Industrial Operations (DIO). During the evaluation there were normally seven to nine dining facilities operating feeding about 6,000 meals per day.

B. FACILITY: The Ingredient Preparation Activity (IPA) facility at Fort Lee is housed in a bay area of the TISA cold storage facility (Building 7118). An alternative to use of such a facility would be a vacant dining facility which can be slightly modified to accommodate an IPA operation. The IPA design, facility layout, and equipment configuration is based on the menu items which are to be prepared in the facility. The facility is designed to prepare menu items in support of the 42-Day Armed Forces Menu and the Army Master Menu (SB 10-260). The Master Menu is adjusted locally by the installation menu board to balance the IPA workload, but these changes are not extensive or of a significant nature. The Ingredient Preparation Activity



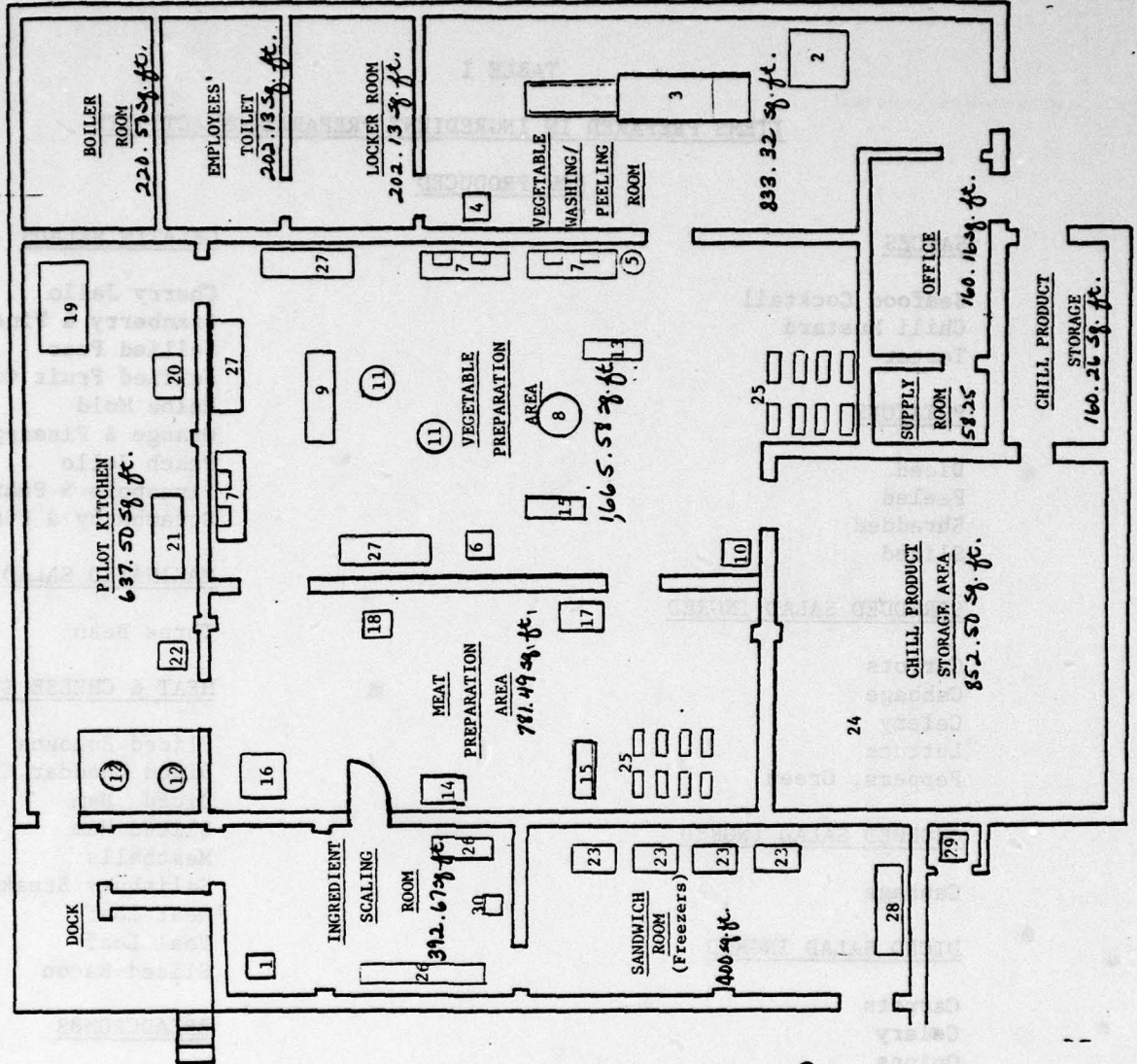
productive capability provides sufficient flexibility to accommodate local variation of the menu and shifts of consumer food consumption as well as expansion of the production capability with variations of troop strength. A sketch of the Fort Lee IPA facility layout is at Figure 1; a detailed description of IPA Operational Areas, equipment list, and production and internal procedures are at Annex A.

C. PRODUCTION: The IPA prepares certain menu components which can be processed satisfactorily at a central location while reducing labor required in dining facilities. Some menu items are completely processed and packaged for delivery so that the only requirement in the dining facility is portioning, garnishing, and serving (gelatin salads). Other items are partially processed and the dining facility finishes the product either by combining ingredients (salad vegetables) or actually cooking the item (bacon, meatballs, and Salisbury steaks). Some items are sent to dining facilities in essentially a finished state ready for serving (sauces) or for use in other dining facility products (breadcrumbs). Table I shows the menu items and components prepared in the Fort Lee IPA and other items which could be prepared. Specific internal operating procedures for each product are available from TSA or Fort Lee.

D. INGREDIENTS: The Ingredient Preparation Activity uses normal Troop Issue Subsistence supply items which are listed in the monthly Master Menu and selected from the Federal Supply Catalog C-8900-PL. The Ingredient Preparation Activity uses items in the largest-sized containers available to ease handling and to economize on costs. Where different types of ingredients are required, other than those listed in the Federal Supply Catalog (such as sulfite dip for fresh vegetables), these requirements are submitted through normal, new or commercial item authorization procedures.



FIGURE I



INGREDIENT PREPARATION ACTIVITY

1. Scales
2. Food Washer
3. Potato Peeler
4. Ice Machine
5. Centrifuge
6. Table w/Scale
7. Sink
8. Halide Dicer
9. Urschel Dicer
10. Qualheim
11. VCM (2)
- \* 12. Steam Kettle
13. Stainless Steel Table
14. Table w/Meat Slicer
15. Meat Slicer-Floor
16. Meat Mixer
17. Meat Former (Meatballs)
18. Molding Machine
- \* 19. Convection Oven
- \* 20. Lidding Machine
- \* 21. Fill/Clos Machine
- \* 22. Tipper Tie
23. Freezer
24. Cooler
25. Wire Baskets
26. Storage Cabinets
27. Pan & Storage Racks
28. Blower Unit
29. Condenser Unit (for Refrig.)
30. Hand Sink

\* Equipment in Pilot Kitchen



TABLE I

ITEMS PREPARED IN INGREDIENT PREPARATION ACTIVITY

NOW PRODUCED

SAUCES

Seafood Cocktail  
Chili Mustard  
Tartar

POTATOES

Diced  
Peeled  
Shredded  
Sliced

SHREDDED SALAD INGRED

Carrots  
Cabbage  
Celery  
Lettuce  
Peppers, Green

CHOPPED SALAD INGRED

Cabbage

DICED SALAD INGRED

Carrots  
Celery  
Onions  
Peppers, Green

GELATIN SALADS

Cherry Jello  
Cranberry & Pineapple  
Jellied Pear  
Jellied Fruit Cocktail  
Melba Mold  
Orange & Pineapple  
Peach Jello  
Pineapple & Pear  
Strawberry & Pineapple

MARINATED SALAD

Three Bean

MEAT & CHEESE ITEMS

Sliced Bologna  
Diced Cheddar Cheese  
Diced Ham  
Sliced Ham  
Meatballs  
Salisbury Steak  
Meat Loaf  
Veal Loaf  
Sliced Bacon

BREADCRUMBS

POSSIBLE PRODUCTION

Meat Patties	French Fries
Pizza Sauce	Sandwiches
Bar-B-Que Sauce	Panned Sausage
	Baking Potatoes (Foil Wrapped)



SECTION III  
EVALUATION FINDINGS/RESULTS

The IPA evaluation was conducted jointly by the Troop Support Agency (TSA) and the Directorate of Food Management (DFM), Fort Lee, Virginia, with the technical support of US Army Natick Research and Development Command (NARADCOM). These activities were responsible for evaluating specific aspects of the system and for the preparation of after action reports. The findings/results of the evaluation program are summarized below and the individual reports are annexed as referenced.

A. IPA OPERATIONS AND PRODUCTION:

1. General: Fort Lee operated the IPA in support of the Fort Lee Food Service Program during the evaluation (January - April 1979). Support from IPA to the Central Kitchen (CK) terminated when the CK closed on 8 March 1979. Fort Lee reported IPA production of 538,936 servings in support of 757,130 meals served in Fort Lee dining facilities from 2 January through 30 April 1979. This support included only a limited quantity of sliced bacon for test purposes. Dining facility managers strongly support the IPA because it performs numerous, time-consuming tasks required in preparing food items for cooking and/or serving and frees both cooks and food service workers to perform other essential tasks, including sanitation. Other Fort Lee comments are interspersed within the various topics of this section. The complete Fort Lee User/Operator report is at Annex B.



## 2. Production:

### a. Production Procedures:

(1) The 42-Day Master Menu and dining facility managers' desires were considered in the selection of items to be produced in the IPA. Some deviations from the menu were implemented by Installation Menu Board action to enable the IPA to operate more efficiently. Support to dining facilities included centrally processed salads, salad ingredients, sauces, breading materials, and certain meat and cheese items. A variety of vegetable and gelatin salads were offered on a continuous basis as well as other items on a set schedule according to the Master Menu and dining facility managers' requests. The items actually produced during the six month period, November 1978 through April 1979, are at Table II.

(2) Fort Lee reported the production planning, scheduling, and control procedures used in operating the IPA to be acceptable. Careful planning of the production of particular items on specific days played a principal role in the success of this operation since shelf life had major importance. Also, because production of some items required several persons and other items required only one person, it was necessary to adjust the production schedule to provide an essential workload balance for proper utilization of the available IPA personnel to match dining facility demand. Description of these procedures is in the Fort Lee report at Annex B.

(3) The operational guides used for the IPA functions were furnished by NARADCOM. Modifications were made to fit Fort Lee requirements and Fort Lee reported that for the most part, these guides proved sufficient. These guides on procedures are not included in this report, but they are available from



TABLE II

## INGREDIENT PREPARATION PRODUCTION

NOV 78 - APR 79

Item	Total Lbs. for 6 Mo.	Avg. Lbs. per Month	No. of Issues for 6 Mo.	Avg. No. Lbs. per Issue
Whole-Peeled-Potatoes	25,560	4,260	50	511
Diced Potatoes	7,940	1,323	26	305
Sliced Potatoes	8,345	1,391	27	309
Shredded Potatoes	5,731	955	24	239
Cabbage, Sh.	10,055	1,676	71	142
Lettuce, Sh. (3 Mo.)	6,115	2,038	33	185
Carrots, Sh.	750	125	51	15
Celery, Sh.	305	51	29	11
Celery, Diced	635	106	30	21
Onions, Diced	1,930	322	50	39
Green Peppers, Diced	845	141	52	16
Carrots, Diced	665	111	46	15
Cabbage, Ch.	4,365	728	69	63
Ham, Diced	4,875	813	50	98
Bologna, Sl.	1,955	326	29	67
Ham, Sl.	4,910	818	48	102
Cheese, Cheddar, Diced	5,445	908	52	104
	<u>Servings</u>	<u>Servings</u>		
Three Bean Salad	6,930	1,155	24	289
Seafood Cocktail	17,777	2,962	45	395
Tartar	31,290	5,215	50	625
Jel. Pear Salad	19,640	3,273	25	786
Peach Jello Salad	13,750	2,291	21	655
Cherry Jello Salad	16,430	2,738	25	657
Cranberry-Pineapple	12,510	2,085	25	500
	<u>Total Servings for 6 Mo.</u>	<u>Avg Servings for 6 Mo.</u>	<u>Issues for 6 Mo.</u>	<u>Avg per Issue</u>
Jel. Fruit Cocktail, Salad	19,350	3,225	25	774
Pineapple-Pear, Salad	11,800	1,966	23	513
Orange-Pineapple, Salad	10,845	1,807	25	434
Strawberry-Pineapple, Salad	14,210	2,368	24	592
Melba Mold, Salad	6,180	1,030	21	294



Fort Lee or TSA. Keesler AFB personnel indicated they used TM 10-412 recipes for production, but no specific procedures were evident. As indicated in Section II, the IPA used normal subsistence items as listed in the Master Menu (SB 10-260) and Federal Supply Catalog. No problems surfaced regarding the quality of raw ingredients received from the military subsistence supply system.

(4) Preprinted availability lists of IPA items are provided dining facilities and the TISA on a monthly basis. Dining facilities request IPA items using these availability lists and IPA production is scheduled to meet these demands. Raw ingredients are drawn from the TISA. Finished products are delivered by the TISA with normal issues on a 2-2-3 ration issue frequency. Fort Lee reported no difficulty with these procedures and dining facility managers were satisfied with this support. At Keesler AFB, IPA items were issued daily to six dining facilities simplifying storage and production requirements. Keesler's ordering and production scheduling procedures were similar to Fort Lee's.

b. Analysis of Production:

(1) During the period 2 January through 21 May 1979, TSA personnel observed and collected data on the operational activities of the IPA, including preparation of products in the IPA and in dining facilities. The purpose was to determine and to compare relative efficiencies and costs for IPA and dining facility preparation. These surveys recorded the actual time it took to accomplish specific tasks; number of persons involved; equipment used and the time in use; products processed with raw weight and finished product yield; and types and quantities of supplies used to package the products. Detailed discussion and examples for these comments are at Annex C.



(2) Production of gelatin salads has been a mainstay of the Fort Lee IPA from its inception. These items have very high acceptabilities in the dining facilities and offer some labor savings. Even though production of these items transferred labor requirements from the DF to the IPA, packaging costs must be considered. However, surveys showed that, in spite of packaging costs, there are still potential savings considering only labor, packaging, and food costs for IPA salads. The salads are packaged in disposable aluminum half-sized steam table pans which cost Fort Lee \$.293 per pan or \$.0117 per serving. The cost of labor, food, and packaging for 100 servings of gelatin salad (fruit cocktail) at Fort Lee was \$6.09 in the IPA (based on 550 and 775 servings) compared to \$6.30 and \$7.02 in the DF (based on 100 servings) which does not include packaging. However, jellied pear salad cost \$6.10 in the IPA for 100 servings (based on 1040 servings) versus a range from \$4.75 to over \$10.00 (based on 100 and 70 servings) in the dining facility. The Keesler AFB CFPF did not produce gelatin salads because dining facility quality was considered better. Meat loaf, since it is a manual operation in the IPA (except for mixing), costs about the same in the IPA and DF.

(3) Sliced bacon was added to the Fort Lee IPA production list on a test basis in an effort to reduce food costs and dining facility workloads. Previous practice was for dining facilities to take presliced, frozen, partially shingled bacon from the refrigerator/freezer, temper in the kitchen, and shingle on sheet pans. This work was usually conducted during slack periods between meals on the day before the bacon was required. The purchase of slab bacon with slicing and shingling in the IPA not only saved \$.11 per pound on the cost of bacon, but was also extremely less labor intensive than the former dining facility function. Cost for labor to process 3,000 servings of bacon



in the IPA was \$.80 per 100 servings versus \$1.55 in the DF.

(4) Originally the Fort Lee IPA processed salad ingredients and combined them into prepared salads (Spring, Perfection, Garden Vegetable, Carrot and Raisin, and Cole Slaw) for delivery to dining facilities. However, shelf life and dining facility managers' desires resulted in a decision to furnish separate salad ingredients to the dining facilities where several kinds of finished salads could be prepared and served. Either system saves considerable time in the dining facility, reduces the workload, and removes the waste disposal problem for trimmings from the DF. The Keesler AFB facility provided the premixed salad ingredients in a variety of different salads.

(5) Whole peeled, sliced, diced, and shredded potatoes are processed in the IPA. The lye potato peeler is very efficient and results in considerable labor savings for this operation and further provides improved yields over those achieved in dining facilities and suggested in the TM 10-412 recipe series. It has been concluded, however, that the Fort Lee lye potato peeler is considerably oversized and that smaller abrasive potato peelers can do the same job at less cost. These are effectively used at Keesler for more than double the Fort Lee production, are less expensive (two-three thousand dollars a peeler versus over ten thousand dollars for the lye potato peeler), and do not entail the hazards associated with lye peeling. The processing of potatoes centrally also achieved significantly improved yields over yields observed in dining facilities and suggested or standard yields identified in the TM 10-412 recipe service. For instance, the IPA achieved an average yield of 84.8% for whole peeled potatoes versus 64.9% for Fort Lee and Fort Eustis dining facilities and 77.7% yield suggested in the TM 10-412 recipes.



(6) As discussed in para B, Facilities and Equipment, and para I, Expansion and Mobilization Capabilities, the Fort Lee IPA was considered underutilized/overdesigned. From 20 January through 20 April 1976, Fort Lee increased ingredient preparation production of salads to support Fort Eustis, Virginia. There was no associative adverse impact on support to Fort Lee dining facilities. A similar increase in IPA production was experienced during the CFPS expanded production test conducted from 10-20 October 1978. Based on these exercises, it is concluded that the design of the Fort Lee IPA is more than adequate to support an increased troop population at Fort Lee and the equipment is generally oversized.

(7) The Fort Eustis support mentioned above was to four of the eight dining facilities then operating, with 22 salad items. During this period, data collection was accomplished to measure potential labor savings with IPA support. Fort Lee reported at that time that the Fort Eustis support proved the potential for labor reduction and ingredient savings with IPA support. The optimum production level of the IPA was not achieved, but potential for increased productivity was evident. Fort Lee also reported that the manhours saved in dining facilities (2 hours per shift per facility) for salad preparation, could be diverted to other tasks, or partially fill the void of personnel shortages. Observations of operations at Fort Eustis indicated that an intensive orientation/training program had to be an integral part of IPA expansion/support. Minimum requirements for this program would include instruction in ordering, handling, storage procedures, and display and serving techniques of pre-processed salads. The transportation of the salads to Fort Eustis posed no problems, but the small quantities involved did not justify the cost. Shelf life after delivery seemed to be a problem at Fort Eustis and dining facility managers complained about quality.



Based on these results, no consideration was given during the current evaluation to providing regional support to other installations from a Central IPA.

(8) Depending on staffing, equipment available, and local desires, selected items could be added to the IPA production list, such as sandwiches, panned sausage, and french fries. Sandwiches have been prepared on occasion at Fort Lee with relatively high acceptance. Labor savings are marginal for sandwiches, however, compared to problems of handling. Although no significant labor saving is possible by centrally panning sausage, the transfer of this workload to the IPA as well as other similar operations may provide the labor savings in dining facilities needed to offset IPA staffing. The Keesler AFB CFPF produced french fries and the related food cost savings can be measured (the data was not available). Fort Lee and other Army posts may find that the increased IPA workload for processing french fries, problems with quality control, increased management, and food handling offset food cost savings.

(9) Keesler AFB produced mainly IPA type items including premixed salads, sauces, sliced and diced meats and cheeses, and, as mentioned, french fries. Keesler AFB also produced some entree items, which were shipped partially processed to dining facilities. These included lasagna, spareribs, marinated meats, and breaded chicken. Equipment used at Keesler was similar to that in use at Fort Lee except for abrasive potato peelers rather than a lye peeler. Productivity at Keesler AFB was very high, and considerably more servings per ration were provided dining facilities than at Fort Lee. (Detailed trip reports at Annex F).

(10) Significant conclusions from these observations in the IPA and dining facilities include the following:



(a) The IPA achieved significant savings in time and costs over that required in dining facilities to perform similar or the same operation/function. However, it should be noted that there was considerable variation in the amount of time required between dining facilities to perform the same function.

(b) There was notable variation in yields between dining facilities, the IPA, and suggested or standard yields identified in the TM 10-412 recipe service. For almost all items surveyed, the IPA achieved significantly better yields than Fort Lee and Fort Eustis dining facilities, and better yields than suggested in the TM 10-412 recipes.

(c) Increased production to support a larger population or more items could easily be achieved. This would provide more effective use of personnel, facility, and equipment.

### 3. Packaging, storage, and distribution:

a. Aluminum pans and heavy duty plastic bags were selected to transport the IPA products and proved excellent for handling purposes, but aluminum pans were costly (\$.293 per pan with lid). Fort Lee recommended that lower cost, alternative packaging be explored. Although information on other packaging costs was obtained, NARADCOM was unable to identify equivalent packaging at a lower cost. Therefore, final resolution of this problem was not achieved. If the IPA concept is adopted as a command option, it is necessary to thoroughly explore alternative methods of packaging IPA products including plastic, styrofoam, or waxed cardboard containers and reusable stainless steel pans. Dining facility sheet pans were used for sliced bacon and no problems were noted in reuse of these pans. There were minimal problems encountered in waste disposal at Fort Lee. Detailed description of IPA packaging



and discussion of relative packaging costs is at Annex A.

b. Distribution and storage requirements were not affected to any noticeable extent by the operation of the IPA. The prepared products were stored within the refrigerated storage room and delivered during normal schedules of the TISA, i.e., Monday, Wednesday, and Friday. Storage of IPA products in the dining facilities did not present any problem.

B. FACILITY AND EQUIPMENT:

1. Facility:

a. A converted meat cutting facility within a bay area of the TISA cold storage warehouse was renovated for use as an IPA in 1974. Although the area was refrigerated, Fort Lee indicated the facility was not ideal. It did not provide the proper facilities or layout to create good work flow for the ingredient preparation tasks. The quarry tile floor, dangerously slippery when wet, slowed down traffic. A pot and pan washing system was not included, which caused these items to have to be hand washed. Overhead meat rails, which were not removed during the renovation, caused cleaning problems. Areas for meat and vegetable preparation were separated by a temporary screen rather than a more sanitary permanent partition. Space for meat tempering was also needed. Fort Lee indicated that due to economizing on costs for renovation of the area, extra manhours were required to keep conditions safe and sanitary. Other comments are in the Fort Lee report. An unused dining facility could be converted to an IPA at minimal cost with addition of necessary vegetable/meat processing equipment and refrigerated storage. When new TISA's are constructed, IPA facilities could be constructed contiguous to the new TISA.



b. The IPA facility and equipment were adequate for production to meet Fort Lee requirements. As observed elsewhere, production capacity could be increased (and was on two occasions) without serious impact on the operation. Based on Fort Lee's experience, projections of space requirements for different sizes of IPA's were determined (Incl 4 to Annex A) and used in the economic analysis.

2. Equipment:

a. The Fort Lee IPA's equipment is shown at Figure I (Section II) and discussed in more detail at Annexes A and D. Based on Fort Lee's equipment usage and observations by NARADCOM and TSA, a modified equipment list was used for the economic/cost analysis (Annex I). NARADCOM also developed a recommended production equipment list for different sizes of facilities, which is at Incl 5 to Annex A.

b. Very few of the IPA equipment items are CTA 50-911 items normally found in dining facilities. The high speed, high production, state-of-the-art type of equipment in the IPA requires special care and training of personnel to operate. Fort Lee indicated that a training program in the safe and proper operation of each piece of equipment prior to start-up of operation of an IPA is definitely required.

c. Fort Lee IPA equipment operated very satisfactorily with few maintenance problems. However, Fort Lee reported that one floor-type slicing machine and one vertical cutting machine caused sanitation problems. This equipment demanded special and frequent cleaning while in use.

d. During the CFPS evaluation, NARADCOM equipment specialists reviewed operation and use of both Central Kitchen and IPA equipment. Discussion of the observations of NARADCOM personnel related to IPA equipment is at Annex D.



TSA also reviewed equipment use along with Fort Lee. All parties concluded that most equipment was not used extensively and that significantly increased production could be achieved with available equipment and personnel.

e. While much of the equipment at Fort Lee is high production, state-of-the-art equipment, this type equipment is not essential to satisfy many IPA production requirements. An example would be use of an abrasive potato peeler, rather than the lye peeling machine at Fort Lee. Keesler AFB used two large dining facility type peelers to satisfy a larger production requirement than Fort Lee.

f. Fort Lee reported that dining facility equipment as authorized by CTA 50-911 proved adequate to support the IPA products. Vegetable peeling machines had been removed from Fort Lee dining facilities. For purposes of the economic analysis, vegetable peelers, vertical cutter mixers, and some meat slicing machines and sinks were eliminated from dining facility equipment requirements. This decision was supported by observations at Keesler AFB.

C. ACCOUNTING AND FINANCIAL:

1. An informal control register was maintained in the IPA to record all TISA receipts and returns. An abstract record was kept simultaneously in the Accounting Section of the TISA and both records were reconciled at the end of each accounting period (monthly) before posting to the Voucher Register and General Control by the TISA. This procedure was audited and approved by the Office of the Comptroller, Fort Lee. Description of the standard price and accounting system is included at Annex A. The need for additional personnel in the TISA to process documents for IPA issues was addressed. The additional TISA workload at Fort Lee for IPA issues and accounting did not justify any added personnel authorization. However, a potential



requirement could exist at larger bases depending on the number of daily rations, the number of dining facilities, and the method of processing/issuing IPA products.

2. The menu was changed by Fort Lee to offer a wide variety of gelatin salads and salad ingredients, and dining facilities were permitted to order those items desired. These changes and IPA operations caused no impact upon the Army Ration Credit System (ARCS) regarding the financial postures in the dining facilities. Fort Lee also stated that the installation stock fund was not affected by the operation of the IPA.

D. QUALITY CONTROL/QUALITY ASSURANCE:

1. The TSA Veterinary Staff Office discussion of the IPA operation is at Annex E.

2. Direct veterinary support was provided by the staff of the Technical Support Office, Directorate of Food Management (DFM), which included normal veterinary food inspection and sanitation as well as quality control. The quality control support involved primarily checking the accuracy of weights and measures for components. Adequate surveillance was maintained to assure adherence to basic public health principles as well as to provide normal veterinary food inspection support to the TISA. A protocol for continued veterinary support for the IPA was developed by the Veterinary Activity, Fort Lee MEDDAC, and representatives of the DIO, Fort Lee. The support outlined in that protocol is limited to normal veterinary food inspection and sanitation surveillance in addition to "post-consumption" microbiological testing by the US Army Medical Laboratory Service (Fort Meade, Maryland).



3. The Fort Lee IPA had organic food laboratory support since its inception in April 1975. The data derived from this support indicates that the foods prepared in the IPA are generally "low risk" items and that preconsumption analysis is not essential. The protocol developed for the IPA provided for laboratory analysis to be performed on the processed items to detect trends and to spot problems in sanitation. The post-consumption testing was based upon the premise that sanitation and separation of different classes of foods would be diligently controlled by the IPA management.

4. Adequate refrigeration is essential in storage facilities, meat tempering rooms, preparation areas, and transportation vehicles to prevent spoilage. The guidance contained in AR 40-5 is adequate for storage and tempering. The preparation room temperature of 50-55° is acceptable for the purposes of an IPA.

5. Shelf Life Parameters are shown below:

High Risk Items - Consumption Within 36 Hours

Salisbury Steak	Diced Ham
Meat Loaf	Sliced Ham
Meatballs	Sliced Bologna
Sliced Bacon	Sliced Salami
Seafood Cocktail Sauce	Tartar Sauce

Medium Risk Items - Consumption Within 96 Hours

Diced Cheddar Cheese	
Sliced American Cheese	
Cabbage (diced/ shredded/ chopped)	Celery (shredded/diced)
Lettuce (shredded)	Peppers (shredded/diced)
Carrots (shredded/diced)	Onions (diced)

Low Risk Items - Consumption As Indicated

Potatoes (peeled/sliced/diced/shredded)	8 days
All Gelatin Salads	15 days
Three Bean Salad (Marinated)	15 days



6. Quality control (weights and measures for components; adherence to established preparation procedures, etc.) is an IPA management function. Close surveillance in this area was maintained at the Fort Lee IPA. Operational guides, for processing raw products, were furnished by NARADCOM. Adherence to these guides was carefully monitored by TSA.

7. The conclusions from this part of the evaluation were that:

- a. Refrigerated operational/production area is required.
- b. Normal veterinary and preventive medicine staff monitoring of IPA activities are required.
- c. After-the-fact laboratory analysis of IPA products is sufficient.

8. Recommendations provided by the Veterinary Staff Office of TSA included:

- a. The protocol (See Incl 2 to Annex E) established for Fort Lee be adopted for any future Ingredient Preparation Activities.
- b. That laboratory support for IPA's be provided by the Army Medical Laboratories.
- c. That refrigeration for IPA's be designed to conform to the requirements of AR 40-5 and MIL-STD-903A.



E. ACCEPTANCE OF IPA PRODUCTS:

1. Based on a discussion with Mr. Bob Kluter, NARADCOM, Food Sciences Laboratory, it was determined that additional consumer surveys of IPA items would not be a sufficiently sensitive evaluation. Basically, the evaluation would be of partially finished products (diced ham and cheese; meatballs<sup>4</sup> and other ground beef items; peeled potatoes (whole, diced, and sliced); and diced, shredded, or chopped salad vegetables). Many of these products lose their identity when they undergo final preparation in the dining facility. Some items finished in the IPA, e.g., gelatin salads, were evaluated previously and had relatively high acceptabilities. Some meat items which were initially processed in the IPA, cooked and frozen in the Pilot Kitchen or CFPF, and finished in the dining facility were also rated. These received equal or higher ratings than items prepared in the dining facilities. The results of the previous food acceptance surveys follow:

a. Salads (all prepared in IPA)		<u>Overall Opinion (7 Point Scale)</u>
Jellied Pear	5.9	
Orange & Pineapple	5.6	
Pineapple & Pear	5.5	
Spiced Peach	3.4 (no longer produced)	
b. Meat Items		
Salisbury Steak	DF - 4.6	<u>Legend (Where Prepared)</u>
W/Tomato Gravy	CK - 5.4	
Meat Loaf, Mushrooms	DF - 4.7	DF - Dining Facility
W/Brown Gravy	CK - 4.9	CK - Central Kitchen
		PK - Pilot Kitchen
Swedish Meat Balls	DF - 5.1	
	PK - 5.1	
Salisbury Steak	DF - 5.0	
W/Brown Gravy	PK - 5.4	



2. As part of the CFPS evaluation, NARADCOM technologists observed Ingredient Preparation products in Fort Lee dining facilities. Following are comments related to IPA operations from NARADCOM trip reports:

a. Mrs. Jessie McNutt, Home Economist, Experimental Kitchens Branch, stated that salads from IPA were served very attractively and the lettuce in refrigerators was in excellent condition. Gelatins were attractive and had excellent flavor and texture.

b. Ray Young, Food Technologist, FEL, Animal Products Group, indicated that the salads made from lettuce and cabbage from Ingredient Preparation were outstanding and of superior quality.

F. FOOD SERVICE AND COMMANDER ATTITUDES: During conduct of attitude surveys related to the CFPPF, NARADCOM reported that Fort Lee cooks expressed appreciation of the IPA. Receiving salad ingredients and vegetables ready for final preparation is an advantage for the cooks (one of the points cooks perceived as being good about a Central Food Preparation System). Commanders also perceived that the IPA was one of the positive aspects of Central Food Preparation. Questionnaires related solely to the IPA support were completed by food service personnel in Fort Lee dining facilities. With only minor objections related to skills required of cooks, dining facility managers enthusiastically supported the IPA operation. A summary of responses to this questionnaire is at Annex G.



G. STAFFING AND TRAINING:

1. Ingredient Preparation Activity:

a. A work sampling survey of the IPA was conducted during the evaluation of the CFPF in June 1978. This survey was supervised by the Operations Research and Systems Analysis Office (OR/SA), NARADCOM. The data collected by TSA was validated, reduced, tabulated, and analyzed by personnel at NARADCOM. The results showed a stable and manageable work force. Since the IPA had been in operation for nearly three years prior to the survey, sufficient time had elapsed to eliminate the problems normally associated with a new operation. Staffing seemed adequate and efficient, but no specific central criteria could be ascertained for comparison. The data collected, as reported in the CFPS report, is at Annex G. This data was based on a ten person staff performing current IPA functions plus scaling of ingredients, tempering, some partial processing, and issuing meats to the CFPF.

b. When the CFPF was closed, staffing was reduced initially to seven persons and then to six persons. The initial staff of seven persons included: an NCOIC (E-8); one First Cook (E-6); one Senior Cook (E-5); one Cook (WG-8); and three Food Service Workers (one WG-2 and two WG-1's). Later, the staff was reduced by the one NCOIC position with the First Cook serving as NCOIC. This reduced staff was considered adequate by Fort Lee, even with bacon slicing added to production.

c. The Fort Lee Staff was thus used as the basis for staffing other operations for the Economic/Cost Analysis (Table III):



TABLE III

IPA Staffing Requirements

Installations (IPA Meals/Day)		Fort Lee (6,350)	Fort Carson (10,960)	Fort Lewis (16,580)	Fort Knox (23,550)
Fd Supv	E8	0	0	0	1
	E7	1	1	1	0
First Cook	E6	0	0	1	1
Sr Cook	E5	1	1	1	1
Cook	E4	1	1	1	2
Cook PPT	WG5	1	1	0	0
Fd Wkr Ldr	WL5	0	1	1	1
Fd Svc Wkr	WG3	1	1	1	2
Fd Svc Wkr	WG2	1	1	2	2
TOTALS		6	7	8	10

d. Based on frequent observations by TSA and NARADCOM during the CFPS and IPA evaluations, the utilization of personnel at Fort Lee appeared to be less than ideal. This often could be attributed to operational requirements. Some items processed require the services of several persons, while others only require one or two persons. To effectively utilize the IPA staff for maximum productivity, careful scheduling of product is essential. As an example, several items requiring one or two persons to adequately process (clean-up included) would be planned for the same day in order to employ the whole staff. Those items requiring several people could be scheduled singly for other days. In addition, there are other items, e.g., condensed soups, stews or lasagna, that could be partially prepared in the IPA, if equipment and facility were adequate, to help alleviate staff shortages in Dining Facilities.

e. Fort Lee recommended special training of IPA personnel in use of the IPA equipment. Other skill levels required of IPA personnel were essentially cook-type skills, which required minimal training. Special orientation and training in high production operations, sanitation, and quality control were



also identified by TSA for any new IPA operation or new personnel. The advantages and disadvantages of rotating military personnel through the IPA are discussed in para 10 of the Fort Lee report at Annex B. Fort Lee also discussed the advantages and disadvantages of using direct hire food service workers versus contract food service workers in the IPA.

f. Keesler Air Force Base staffing consisted of 13 permanent Civil Service employees and 10 contract food service (KP) workers. These personnel supported 12,000 meals per day in 6 dining facilities, slightly more than supported at Fort Carson in over 20 dining facilities. Keesler production was approximately three times that of Fort Lee.

## 2. Dining Facilities:

a. During 1978, Fort Lee dining facility staffing was based on the approved TDA under the Central Food Management System with the Director of Food Management (DFM) operating and controlling Fort Lee dining facilities. The dining facility staffing was reduced on 1 Mar 1978 when the Central Food Preparation System (CFPS) became operational and Central Kitchen began supporting dining facilities. Prior to termination of the CFPS program and closure of the Central Kitchen in March 1979, a TRADOC manpower survey team recommended increased staffing for Fort Lee dining facilities. With closure of the CK and transfer of the DFM functions to the DIO and QM Brigade, personnel were added to the Fort Lee dining facilities from the Central Kitchen.

b. Because of the above described turbulence in Fort Lee Dining Facility staffing, and the recognized shortcomings in the TDA staffing authorized by DA pamphlet 570-551, alternative staffing was used for the economic analysis of IPA. This staffing was the same as that used as baseline conventional staffing for the CFPS economic analysis and is shown in Table 8 of Annex H.



c. The economic analysis conducted by the University of Massachusetts included potential savings of dining facility personnel with IPA support. This analysis is discussed at para K of this section, and projected personnel savings only in dining facilities serving over 223 rations per day. Two persons were projected to be saved in dining facilities feeding over 624 rations per day. Attempts to more precisely determine DF staff savings were made during TSA data collection efforts in the IPA and DF. These projections, based on observed data on manhours required to perform various IPA functions in both the IPA and DF, identified total man-hour savings. However, these could not be accurately used to project manyear or manpower space savings since several of these functions may be performed by a number of dining facility personnel at the same time. This would preclude any chance to save whole manyears or spaces - only many parts of individual time. Because the savings of personnel is only projected in facilities feeding over 223 rations per day, insufficient personnel are saved in the dining facilities to make IPA cost effective. If one man-year or manpower space could be saved in dining facilities serving over 150 rations per day, the IPA concept would be more closely cost effective.

d. In 1976, Keesler AFB personnel estimated that 30-40 personnel were saved in the 6-7 dining facilities receiving IPA-type support along with some entree items. During a subsequent visit in 1979 (Annex F), a savings of at least 13 personnel was estimated by Keesler personnel. Using the University of Massachusetts economic analysis estimate of staff savings, at least 12 dining facility personnel could be saved at Keesler AFB and potentially more, depending on original dining facility staffing.



e. As discussed in para F, Section III, the Questionnaire at Annex G was distributed to Fort Lee dining facility personnel to obtain opinions on IPA support. Results of the survey were very positive toward IPA support except for the potential problem related to cooks' skills. This concern was addressed to the Quartermaster School and their response is at Incl 2 to Annex G. They responded that the type of items prepared in the IPA require skills essential to normal cook's training and profession. Also, they indicated the QM School "does not approve of IPA if it diminishes in any way those skills of the cook which would be essential in other circumstances if IPA was not available."

f. While the potential impact of IPA support on cooks' skills is recognized, it is believed that the actual impact would not be as extensive as indicated by the QM School. Many items remain in dining facilities which require the same type of skills. For instance, cooks still mix the salads and prepare some salad ingredients. Cooks continue to prepare some sauces. Cooks still practice "knife skills" on non-ingredient preparation items, such as vegetables for stews and other recipes, including eggplant, squash, cucumbers, tomatoes, onions, carrots and potato wedges. Dicing/cutting and mixing of meat products are not totally removed from dining facilities as cooks still prepare some mixed meats such as veal loaf, sandwich spreads, chicken and turkey casseroles, and beef hash. It is also significant that dining facilities have been authorized ingredient preparation-type equipment (vertical cutter mixers and slicing and dicing machines) which collectively remove some of the basic "knife skill" processes from cooks duties. IPA support would for the most part remove these same functions along with the appropriate equipment from dining facilities. In addition to the above, IPA-type functions are frequently performed by unskilled food service workers, especially at bases with food service contracts.



#### H. ORGANIZATIONAL STRUCTURE:

1. As indicated earlier, the Fort Lee Ingredient Preparation Activity (IPA) was originally established to be part of the Central Food Preparation Facility (CFPF) at Fort Lee. With the termination of the Central Food Preparation System evaluation, the CFPF was no longer in operation. Therefore, operational responsibility for the IPA was assigned to the Subsistence and Food Service Branch, Supply and Services Division, Directorate of Industrial Operations. Although personnel operating the IPA are assigned to the Quartermaster Brigade, they are supervised by the Installation Food Adviser under the Chief of the Subsistence and Food Service Branch.

2. There is a direct functional relationship of the IPA to the Troop Issue Subsistence Activity (TISA). All food ingredient stocks in the IPA are the property of the TISA which is responsible for requisitioning and issue of IPA supplies. Because certain technical skills required in supervising the IPA were not available in the TISA, the operational control of the IPA was given to the Food Adviser at Fort Lee during this evaluation rather than the TISA. However, it is considered that an IPA could be a branch or section of the TISA. Technical supervision/guidance would be provided by the installation food adviser and medical staff as is already furnished to dining facilities at all installations. If the IPA is adopted, the TSA developed TISA concept of operation will be amended to include the IPA operation.



I. EXPANSION AND MOBILIZATION CAPABILITIES:

1. The analysis conducted for the CFPS evaluation to determine whether an existing CFPF could be expanded on a timely basis to provide subsistence support to mobilized forces was considered adequate when related to IPA expansion. This study was performed by TSA personnel who applied knowledge gained from the Fort Lee CFPF and IPA operations and projected what could reasonably be expected at an installation with a permanent IPA during mobilization.

2. Any situation requiring mobilization, other than selective mobilization, will be of sufficient gravity as to require emergency expansion of the peacetime support base, which includes food service operations. The production capacity of the existing Fort Lee IPA could be substantially expanded within the required time, i.e., hours/days from notification with no adverse impact. This conclusion is supported by the analysis of IPA support of Fort Eustis in 1976 and the increased production of the CFPF in October 1978 as part of the CFPS evaluation.

3. It was concluded that expansion of an existing IPA could be attained by increasing the IPA labor force, extending the work week, using multiple shifts, and increasing batch sizes to the full capacity of the equipment. The operation of an IPA would also reduce the total number of food service personnel required at the mobilization station and could partially compensate for any lack of experienced/trained cooks at the time of mobilization. Finally, it was concluded that an IPA would provide a viable and responsive capability for rapid transitional food service support expansion. Such expansion would greatly enhance the responsiveness and posture of the food service program at an IPA supported installation during mobilization.



J. FIELD FEEDING INTERFACE:

1. Items prepared by IPA were included in the Central Food Preparation Facility field feeding evaluation, which was conducted to determine the potentials and/or limitations of products prepared centrally to interface with peacetime field feeding requirements.

2. Ingredient Preparation items (along with CFPF items) were drawn daily from the TISA by a TO&E company-sized unit. The items were placed in ice chests, transported to the field site, and held in the ice chests until ready for use. The items were consumed within 24 hours and no problems were experienced in retaining the products in a satisfactory condition during this time. Garden vegetable salads were prepared using IPA chopped lettuce, sliced carrots, diced celery, and diced sweet peppers. These items were held in the ice chest until needed for mixing into a salad and then placed in a self-service serving container. Preparation time was considerably shorter than the conventional method and sanitation standards were easily maintained.

3. Diced ham and cheese were also used in the field to make omelets for breakfast. Since the ham and cheese were already diced at the IPA, this labor requirement was eliminated in the field. In addition to the faster preparation and reduced labor, the overall sanitation was improved because the normal food losses/wastes associated with preparing meals from scratch were eliminated. Because IPA packaging reduces the number of cooking and serving pans and utensils used, cleanup time was also shortened considerably.

4. Conclusions from the field feeding evaluation indicate that IPA items are suitable for peacetime field feeding; the use of IPA products reduces food service labor requirements and improves sanitation conditions.



#### K. ECONOMIC/COST ANALYSIS:

1. As in the CFPS evaluation, cost of the IPA was analyzed on an annual cost basis using incremental costs between conventional food service system operations and food service systems employing an IPA. This analysis was also conducted for NARADCOM by the University of Massachusetts Department of Industrial Engineering and Operations Research. System costs derived for the CFPS evaluation for Forts Lee, Carson, Lewis, and Knox were utilized where practical to assure continuity and comparability between the complementary CFPS and IPA analyses. Also, use of the available CFPS data avoided the unnecessary repetition of a majority of the data collection requirements and provided a rational baseline for development of specific criteria for additional data required for the IPA evaluation. Actual costs for operation of the Fort Lee IPA were used for extrapolation to the projected IPA feeding support requirements for the other installations. Food service system costs were determined for the following six specific cost elements or modules applicable to the IPA:

##### a. Capital:

(1) Buildings - It was assumed that an IPA would not require construction of new facilities. Existing buildings (such as DF or other former food facilities) would be renovated and converted for IPA use. Fort Lee conversion costs, updated to current (1979) value, were used to project building costs for the other installations analyzed. Capital recovery costs were computed for an economic life of 25 years at an interest rate of 10 percent.

(2) Equipment - Fort Lee IPA equipment costs, adjusted to current (1979) value, were used as basic requirements. Because Fort Lee equipment had considerable unused capacity these costs were used for all installations. Also dining facilities supported by an IPA would not require certain equipment items necessary for conventional operations (i.e., cutting and slicing machines and



vegetable peelers). Capital recovery costs were computed for an economic life of 10 years at an interest rate of 10 percent. An updated equipment list was developed by NARADCOM, but the difference in annual cost was less than \$5,000.

b. IPA Staffing - Based on Fort Lee IPA experience, a staffing guide has been developed which is shown at Table III. Discussion of IPA staffing and work sampling for the IPA during the CFPS evaluation is at para G, this section.

c. Supplies - Supply costs per ration were based on Fort Lee IPA operations. Further discussion of supply costs is at para A3, this section and Annex A. Reduced packaging costs were explored, but final resolution of alternative lower cost packaging was not achieved.

d. Utilities, Maintenance, and Repair - The detailed economic cost analysis included costs for utilities and facility maintenance and repair (M&R). Such costs are eliminated in this report since IPA facilities would be converted from other usage and the established cost per square foot allocation factors would be applicable for both systems analyzed. However, M&R costs for parts are appropriate and are considered proportional to equipment costs and were computed based on Fort Lee IPA experience data.

### 3. Dining Facility Staffing -

(1) Baseline conventional dining facility staffing was the same as that used for the CFPS evaluation. Different approaches were considered to determine potential dining facility staff reductions with IPA support. As discussed in para A, this section, data was collected in Fort Lee and Fort Eustis dining facilities and the IPA on labor requirements for individual products. However, this data does not provide a sufficient basis to project actual



manpower savings. Work sampling data collected in dining facilities for the CFPS evaluation entailed work categories too broad to effectively delineate the specific work effort that was directly attributed to IPA support. Additional work sampling in dining facilities to determine specific staff savings with IPA was determined to be unfeasible for this analysis.

(2) Finally, it was decided that a separate study conducted by the University of Massachusetts for NARADCOM and published on 8 November 1977, entitled "A Methodology to Estimate Work Force Requirements in Military Food Service Facilities" should be used. This study provided the necessary detail and dining facility work function isolation capability to evaluate the potential for dining facility staffing reductions that might be realized under an IPA support environment. For the economic analysis, personnel reductions were projected only in dining facilities feeding over 223 rations per day. Cost savings reflected in the economic analysis are based on saving either WG-5 or E-4 personnel.

f. Food - Based on Fort Lee experienced data, raw food cost savings are accrued in the IPA by slicing slab bacon centrally as opposed to buying sliced bacon. Also, food savings are projected on the higher yields experienced for non-meat items accredited to the more efficient IPA processing methods. Further discussion of yields is included in Annex C.

2. Results of the economic/cost analysis are summarized in Table IV.



TABLE IV

## IPA ECONOMIC/COST ANALYSIS

## ANNUAL SAVINGS/(COSTS) SUMMARY TABLE IN DOLLARS

<u>Cost Module</u>	<u>Fort Lee</u>	<u>Fort Carson</u>	<u>Fort Lewis</u>	<u>Fort Knox</u>
Capital:				
Building	(11,348)	(11,348)	(12,356)	(13,112)
IPA Equipment*	(15,489)	(15,489)	(15,489)	(15,489)
DF Equipment	7,517	21,130	28,973	41,681
Staffing:				
IPA	(85,192)	(109,362)	(134,406)	(150,283)
DF	54,794	65,068	89,048	56,158
Supplies:	(15,255)	(26,319)	(39,837)	(56,566)
M&R Parts:	(1,110)	(1,110)	(1,110)	(1,110)
Food:	12,137	20,939	31,694	45,003
TOTALS	(53,946)	(56,491)	(53,483)	(93,718)

\* Updated equipment list from NARADCOM has CRC of \$10,744.85 for Forts Lee and Carson and \$11,950.46 for Forts Lewis and Knox.

3. As presented in the foregoing table, the IPA does not exhibit cost effectiveness within the operational parameters evaluated for any of the installations analyzed. Supply costs in every instance are greater than projected food savings. Both of these cost factors have a direct correlation to the number of meals served. Therefore, dining facility personnel savings must offset supply and IPA personnel costs. IPA staffing costs are in all cases greater than the sum of the savings that can be realized in the dining facilities for personnel and equipment reductions. IPA staffing costs also exceed the combination of savings of food costs and dining facility personnel. Capital expenditures basically are constant. Based on the assumptions used in the economic analysis, and the baseline supply cost and staffing for dining



facilities, it is projected that an IPA can not be justified on an overall economic/cost basis. More favorable cost efficiencies can be realized only with reduced supply costs (packaging) and increased savings of dining facility personnel.

4. As indicated above, baseline dining facility staffing for this analysis was the same as used in the CFPS analysis, which is essentially TDA-type staffing. If actual staffing of installation dining facilities is above that used in the economic analysis as shown by Table 8 of Annex H, increased savings of personnel are possible. As an example, if 1 cook is saved in dining facilities feeding 150-223 men, 4 additional cooks could theoretically be saved at Fort Lee and Fort Carson, 11 at Fort Lewis and 8 at Fort Knox. Although these increased personnel savings would make all four installations cost effective or nearly cost effective, an additional detailed evaluation is not considered practical unless proliferation of the IPA concept within the Army food service system is adopted.

5. The Fort Lee IPA was not cost effective as shown in the table above, assuming savings of four persons in dining facilities. Considering the Fort Lee IPA facility and equipment as sunk costs, the Fort Lee IPA is within \$27,000 per year of breaking even. As discussed in para A, this section, the time savings in dining facilities with support by an IPA allows for accomplishment of other tasks, rather than IPA tasks, which would tend to offset some of these costs.

6. The detailed economic/cost analysis is presented at Annex I.



#### SECTION IV

##### SUMMARY

The primary objective of the Army Food Service Program is to provide a high quality meal service to the soldier while minimizing the expenditure of overall food service resources. In line with this objective, the Army constructed, operated, and evaluated the interim Central Food Preparation Facility (CFPF) at Fort Lee, Virginia, and related activities of which the Ingredient Preparation Activity (IPA) was an integral part. The IPA operated for three years before the CFPF became fully operational. Subsequent to the evaluation of the CFPF in 1978, an independent evaluation of the IPA was conducted to determine whether such an activity, independent of the CFPF, would satisfy these program criteria.

The IPA is a more complex troop support system than the conventional system. Upon establishment of the IPA in 1975, changes were required in policies, procedures, and equipment. Also, technological demands were imposed on and integrated into the Fort Lee food service program. Affected areas were in management philosophy, accounting, menu planning, food preparation, packaging, quality control, inventory control, job/task/skill realignments, staffing, training, and motivation.

The Fort Lee User/Operator Evaluation Report and the TSA evaluation of the operational and technological aspects of the IPA operation collectively isolate, identify, and detail both operational advantages and shortcomings with the IPA as evaluated. These reports serve to emphasize the system's positive aspects and identify areas requiring appropriate corrective actions (packaging). These findings generally support the concept that an IPA could improve an



Installation's food service program support. This is further substantiated by the extremely positive aspects of the Keesler AFB Central Kitchen which was also reviewed.

Both the Fort Lee and Keesler Air Force Base ingredient preparation activities provided high quality salad ingredients, salads, and meat and cheese items to dining facilities while:

- a. Reducing overall food costs through lower raw food costs (bacon) and higher yields.
- b. Reducing dining facility equipment requirements.
- c. Removing messy labor and equipment intensive operations from dining facilities to one central area, permitting dining facility personnel more time for meal preparation and service.

Food Service attitudes were very positive toward the IPA. Consumer acceptance of IPA items were also considered favorable. The NARADCOM work sampling survey results and independent TSA and Fort Lee review indicated that the staffing levels were adequate. While Command attitudes toward a high degree of centralization of food preparation were negative (related to CFPF), Commanders felt the IPA activity at Fort Lee was a positive aspect of the CFPF program.

The Quartermaster School indicated that IPA support could reduce skill level qualification of cooks. Review of items left in dining facilities indicated that skill levels would not be substantially affected.

The IPA interface and support of garrison and peacetime field feeding requirements were found to be very satisfactory for labor savings and improved field sanitation. Also, the IPA is projected to afford very positive benefits in the event of mobilization.



The cost/economic analysis conducted by the University of Massachusetts indicates that an IPA, as evaluated at Fort Lee and projected to three other bases, would not be cost effective. Projected food cost savings and hypothetical reductions in dining facility staffing are not sufficient to offset the increased capital and operating and personnel costs for an IPA projected at any of the four CONUS installations analyzed. Based on earlier studies conducted by the University of Massachusetts, personnel savings were projected for only those dining facilities feeding over 223 rations per day. Staffing of installation dining facilities above the baseline staffing used for the economic analysis would provide additional opportunities for personnel savings. As indicated in Section III, savings of one person in dining facilities feeding 150-223 men could make the IPA concept cost effective or nearly cost effective. However, an additional evaluation to determine exact personnel savings is not considered practical unless proliferation of the IPA concept within the Army food service system is adopted.

As indicated, the Fort Lee IPA was not cost effective, assuming savings of four persons in dining facilities. Considering the Fort Lee IPA facility and equipment as sunk costs, the Fort Lee IPA is within \$27,000 per year of breaking even. The savings of time in dining facilities allowing for accomplishment of other tasks, rather than IPA-type tasks, would tend to offset some of these costs. Continued operation of the Fort Lee IPA is considered worthwhile and justified, if desired by Fort Lee and TRADOC.

In conclusion, although the economics evidenced are a deterrent to adoption of an IPA concept, there are distinct advantages to be achieved



with an IPA. The IPA concept could prove to be beneficial at some installations if improvement and refinement of the concept is achieved and close management control is exercised over costs, item production, and personnel utilization.



## SECTION V

### CONCLUSIONS

1. That the IPA evaluation provided those data and experiences necessary to assess the economic impact, operational viability, and system compatibility of the IPA in support of the Army's food service mission.
2. That an IPA provides desirable products and service in support of an installation food service system while reducing total food costs and dining facility labor and equipment requirements.
3. That cooks preferred the support of an IPA as compared to having to perform the time-consuming tasks of the initial preparation of raw food items (washing, trimming, peeling, chopping, dicing, etc.). However, these manhours saved are easily absorbed by other important tasks, e.g., sanitation and food preparation and serving. The impact on cook skill levels would not be significant enough to recommend against the concept.
4. That professional Quality Control and Quality Assurance programs are essential to the ingredient preparation activity concept, but on-base laboratory support is not required.
5. That supervision of the Ingredient Preparation Activity can be effectively accomplished by a Division of the Directorate of Industrial Operations, generally as part of the TISA.
6. That an existing IPA could expand production substantially to support mobilization forces.



7. That some IPA products are suitable for supporting peacetime Field Feeding.

8. That based on the assumptions used in the economic analysis, the IPA is not cost effective for the installations surveyed. The Fort Lee IPA is within \$27,000 of being cost effective, considering the facility and equipment as such cost.

9. That if one man-year or manpower space could be saved in dining facilities serving over 150 rations per day, the IPA concept would be more closely cost effective.



## SECTION VI

### RECOMMENDATIONS

1. That the IPA report be submitted to DA and MACOM's for information.
2. That ingredient preparation activities be approved for establishment at installations only if shown to be cost effective following detailed cost/CITA analysis at the specific installation.
3. That Fort Lee continue to operate the IPA as an effective adjunct to the Fort Lee Food Service program.
4. That Fort Lee review CITA program requirements related to continuation of the IPA.



ANNEX A

INGREDIENT PREPARATION ACTIVITY

CONCEPT OF OPERATIONS AND PROCEDURES



SECTION I  
DESCRIPTION OF THE FACILITY

1. General:

The Ingredient Preparation Activity (IPA) is designed to process certain menu items or components centrally to reduce dining facility labor requirements. Processed items are stored (chilled) and later sent to dining facilities (DF) based on DF requests and processed into final menu items or served as they are. The IPA facility itself can be a free standing facility, but it would generally be an existing facility modified to meet the specific local requirements. The Fort Lee IPA is housed in a portion of the TISA cold storage warehouse, a section formerly occupied by the Fort Lee meat plant. The facility should be proximate to the TISA to conserve on transportation.

2. Organization:

Operational responsibility for the IPA is assigned to the Subsistence and Food Service Branch, DIO. Because of its functional relationship to the TISA, the IPA would normally be a part of the TISA with technical supervision by the Food Adviser. All food ingredient stocks in the IPA are the property of the TISA and are returned to the TISA in the form of finished products ready for issue. At Fort Lee, operational control of the IPA is exercised by the Food Adviser from the Subsistence and Food Service Branch rather than the TISO. Certain skills required to supervise the IPA are not available in the TISA.

3. Production Items:

Menu components selected for production in the Ingredient Preparation Activity are those which can be satisfactorily processed at a central location to reduce labor requirements in dining facilities. Some menu items are completely processed and packaged for delivery so that the only requirement in the dining facility is portioning, garnishing, and serving (gelatin salads). Other items are partially processed and the dining facility finishes the product either by combining ingredients (salad vegetables) or actually cooking the item (bacon, meatballs, and Salisbury steaks). Some items are sent to dining facilities in essentially a finished state ready for serving (sauces) or for use in other dining facility products (breadcrumbs). Depending on the facility and available equipment and the desires of the commander, other labor intensive products could be partially prepared, such as potatoe cakes, french fries, panned sausage, condensed soups, stew and lasagna, and sent chilled to dining facilities. Hamburger patties could be made to reduce overall food cost, but with increased labor cost. Inclosure 1 shows the menu items and components prepared in the Fort Lee Ingredient Preparation Activity and a list of other potential items that could be prepared.

4. Menu and Ingredients:

- a. The Ingredient Preparation Activity prepares menu items in support of



the 42-Day Armed Forces Menu and the Army Master Menu (SB 10-260). The Master Menu is adjusted locally by the installation menu board to balance the Ingredient Preparation Activity workload, but these changes are not extensive or of a significant nature.

b. The IPA uses normal Troop Issue Subsistence supply items listed in the monthly Master Menu which are selected from the Federal Supply Catalog C-8900-PL. Items in the largest available containers are used to ease handling and to economize on costs. Where different types of ingredients are required other than those listed in the Federal Supply Catalog (such as sulfite dip for fresh vegetables), these requirements are coordinated through normal new or commercial item authorization procedures.



## SECTION II FACILITY AND EQUIPMENT

1. The building used for an IPA would normally be converted from other uses for such purpose. The Ingredient Preparation Activity design, facility layout, and equipment configuration is based on the specific menu items which are to be prepared in the facility. The IPA productive capability does provide sufficient flexibility to accommodate local variation of the menu and shifts of consumer food consumption as well as expansion of the processing capability with variations of troop strength. Inclosure 2 is the layout of the Fort Lee IPA. Pilot Kitchen equipment items shown were installed for a preliminary evaluation program prior to the actual on-line operation of the CFPF. Except for one small steam jacketed kettle, this equipment is not needed for the IPA operation. Inclosure 3 is the equipment list for the IPA, including date purchased and purchase price. Inclosure 4 is a Matrix showing equipment used for various IPA products. At Incl 5 is the recommended space allocation for IPA's of different sizes. Inclosure 6 is NARADCOM's recommended equipment list for various sizes of IPA's, based on items produced at Fort Lee.

2. The major functional areas within the Ingredient Preparation Activity are the production and support areas. These areas and the functions performed in each are described below.

a. Production Area: The production area within the Ingredient Preparation Activity includes all aspects of handling the food products for ingredient preparation from raw product receiving and storage to prepreparation and preparation, filling and packaging, and refrigerated storage and distribution. These areas concern converting the raw bulk ingredients into a readily usable product for the dining facility.

(1) Receiving Storage: The receiving storage area receives raw bulk subsistence ingredients to support the anticipated IPA requirements. It must be capable of handling sufficient ingredients to minimize the frequency of non-perishable replacement and of providing refrigerated storage capacity to change to a multi-shift operation. This storage area handles the following type of items: (a) ambient ingredients and working supplies (except toxic materials); (b) chilled vegetables; (c) frozen meats; (d) root vegetables; and (e) toxic chemicals. (The storage of toxic substances will be in accordance with published Army technical manuals and regulations).

(2) Preparation Area: The preparation area involves the tempering and processing of meats, the weighing and measuring of ingredients, and the washing, cutting, and packaging of vegetable items. Items processed in the preparation area may be sent directly to the dining facilities or transferred to the TISA for distribution. The preparation area should consist of the following separate activities:



(a) Ingredient Staging Room - This room has two functions. First, it provides temporary storage for packaged, ambient ingredients to be used for the various products. Second, it provides an area where ingredients from the preparation area can be assembled for each batch prior to final preparation.

(b) Meat Tempering Room - If sufficient space is available, a separate room for tempering meat should be established. This should be a 33°F room equipped for the relatively rapid tempering of frozen meat until it reaches a temperature of about 28°F. If a separate tempering room is not available, meat will be tempered in the receiving (raw product) storage area.

(c) Vegetable Preparation Room - This area is physically divided from the meat preparation room to prevent contamination of products and is separated into a vegetable receiving/cleaning area and preparation area.

(1) Vegetable Receiving/Cleaning Area - This area receives boxed or bagged vegetables from either the root or chill storage area. Vegetables are unpacked and processed in a variety of ways. For instance, vegetables are cored, trimmed, and sent to the vegetable preparation room. Root vegetables are peeled, washed, and inspected and sent to the vegetable preparation area. Some items are sent directly to the distribution storage area, such as potatoes for baking.

(2) Vegetable Preparation Area - This area is essentially a continuation of the vegetable cleaning area but should be separated by at least a portable divider to prevent contamination of products. Root vegetables are inspected, sliced, or chopped and conveyed to the dip tank. Leafy vegetables are washed and conveyed to the dip tank. Equipment should be available to ease the inspection, processing, and packaging of vegetables. Vegetables which go directly to dining facilities without further preparation are packed, weighed, and placed into totes (plastic solid wall and bottom containers with or without lid) or in wire baskets and stacked on dollies or pallets for movement to storage or transport to dining facilities. Leafy vegetables requiring removal of water are packed in nylon mesh bags and transported to the centrifuge. After extraction, contents of the nylon mesh bags are transferred to plastic bags, tied, and moved to storage.

(d) Meat Preparation Room - This area receives packaged meats from the meat tempering room or chilled storage area. Meats will be unpacked and prepared for mixing, slicing, dicing, forming, or other processes. Items such as Salisbury steak will be mixed, formed, and pan-fried in this room and then sent to the distribution storage room.

(e) Portioning/Packaging - Within this area the prepared food items are portioned into predetermined quantities based on the operational guides and packaged in containers for storage and later distribution to the dining facilities. The type of containers used depend on the type of product being packaged, e.g., gelatin salads in half-sized disposable steam table pans and vegetables in plastic bags. (Packaging is discussed in detail in Section IV).



(f) Refrigeration/Distribution Storage - Items prepared in the IPA are stored in this area until issued to the dining facilities or sent to the TISA for distribution.

b. Support Areas: The support areas for the IPA are those not directly related to the processing and storage of food items.

(1) Equipment Washroom - The equipment washroom cleans and sanitizes all utensils and cooking containers used in the preparation area. The carts and containers used in the storage area are also cleaned and sanitized in this area.

(2) Administrative Areas - Sufficient office space is provided for supervisory personnel and performance of administrative and accounting functions necessary for the proper operation of the IPA.

(3) Miscellaneous Facilities:

(a) Wash/Scrub Room - Adequate washroom facilities are provided to ensure all personnel pass through this area prior to entering the preparation area from either the locker rooms or adjacent toilet rooms.

(b) Employee Lunch/Break Room - This room is provided to avoid personnel eating in the food preparation areas. This room is also used as a first aid room for treatment of minor injuries/illnesses and emergency treatment of any major injuries prior to evacuation to a hospital.

(c) Equipment Maintenance Room - The equipment maintenance room houses the steam boiler (if required) and the refrigeration compressors.



### SECTION III OPERATIONAL PROCEDURES

1. Production planning, scheduling, and control are oriented to achieve a balanced workload while providing high quality items to meet requests of dining facility managers.

a. The IPA receives general instructions from the Food Adviser and Menu Board on items to be produced. Item availability lists (DA Form 3294) are furnished dining facility managers monthly. These provide the item, type of package, number of servings contained therein, current monthly price per package, spaces for quantities requested and issued, and total price. Prior to indicating the desired amounts of each item, the dining facility manager should conduct an inventory to determine the quantities of IPA items required.

b. Planning and Scheduling of Production:

(1) Scheduling of production is based on the DA Form 3294 requests. Raw ingredients are ordered from the TISA and supplies are inventoried to ensure necessary replenishment. Processing times are tabulated and personnel are scheduled to tasks accordingly. Proper maintainance of equipment is performed to ensure timely production.

(2) Based on the production schedule, required frozen meats are pulled from the TISA three days prior to processing and tempered. The remaining items are weighed and delivered one day prior to production to the appropriate processing area.

2. Standard Prices:

a. Items prepared by the IPA have a monthly price established in accordance with the C8900PL, Federal Supply Catalog, subsistence, price listings. Distribution of the monthly price list is made to dining facility managers, Troop Issue Subsistence Activity (TISA), and Food Adviser(s).

b. Standard prices for IPA items are based upon the current listing of ingredients provided by the TISA. These prices are updated monthly by the TISA and IPA to insure that the standard prices for IPA products reflect current price changes.

c. Operational guides are based upon the edible portions (EP) weight for all items. In order to insure that standard IPA prices reflect actual cost of ingredients issued, it is necessary that the trim loss percentage experienced within the IPA be used to adjust the raw product price to a finished product price. The IPA uses the previous six month average of trim loss data for each item as a factor for adjusting raw product as purchased (AP) price to a standard finished product (EP-edible portion) price.



This standard price is calculated each month. For example:

Average trim loss percentage is computed by: Determining raw product used minus finished product equals loss; the loss is then divided by the EP weight

Example 1:  $\frac{AP - EP}{AP} = \text{TRIM LOSS}$   $\frac{1.00 - .901}{1.00} = \frac{.099}{1.00} \times 100 = 9.9\%$

(finished product) to arrive at monthly percentage. In the example, the new standard price for carrots has been established which is to be used in pricing all carrot items from the IPA for a month.

#### Trim Loss Data

Example 2:

<u>Item</u>	<u>Month 1</u>	<u>Month 2</u>	<u>Month 3</u>	<u>Avg.</u>	<u>Price</u>	<u>Standard Price</u>
Carrots	9.4%	10.4%	9.9%	9.9%	\$.10	\$.1099 or .11

Formula: Price = Raw Product Cost X (1. + trim loss) = .10 X (1.0 + .099) = .1099

The trim loss data will be changed monthly to reflect the previous six month data and a new standard price will be calculated for the month.

d. To determine how much raw product will be required to provide operational guide EP requirements, the following formula is used:

$$AP \text{ Weight} = (1. + \frac{\text{trim loss}}{EP \text{ weight}}) \times EP$$

### 3. Accounting:

a. A separate informal subsidiary account is maintained by the TISA for the IPA. An informal record of production gains and losses is kept to reconcile net gains or losses due to production at the end of the accounting period. This log is maintained in chronological order and a separate line entry is made for every item produced. The entry shows the date, the item prepared, the raw material cost, and the value of the product produced. A variance amount is entered showing the differences between the raw material cost and the value of the product prepared.

b. The Troop Issue Subsistence Activity is responsible for posting the Dining Facility Account Cards from costed data furnished by the TISA Administrative and Accounting Section.



#### SECTION IV PACKAGING

1. Packaging used in the IPA includes plastic bags (potatoes, vegetables, and meats), aluminum half-sized steam table pans (meats and salads), sheet pans (meats), and reusable heavy duty sheet pans (bacon). Specific items and quantities of servings packaged in each type container is at Inclosure 7. A general description of packaging follows.

a. All four varieties of potatoes are packaged 25 lbs. to each 18 x 24 plastic bag and then sealed with a twist tie. Twelve vegetable products and diced ham and cheese are packaged in the same type of bag and sealed in the same manner. These items are packaged 5 lbs. to each bag.

b. Sliced bacon is panned on heavy duty sheet pans from the dining facilities. Bacon is sliced onto waxed paper. Each pan, which contains 20 lbs. of bacon, is enclosed within a plastic bag with the ends folded underneath the pan. Pans are washed at the dining facilities after removing the bacon and again at IPA before reuse.

c. Aluminum half-sized steam table pans are used for the eight types of jello salads that are prepared and for marinated bean salad. These pans are sealed using cardboard/foil lids. Sliced ham and lunch meat and four pound meat loaves are also put in half-sized steam table pans, but the meat loaves are covered like the bacon.

d. Lightweight aluminum half-sized sheet pans are used for panning Salisbury steaks and meatballs. These pans are also covered with plastic bags with ends tucked under the pan.

2. Filling of containers is accomplished manually in most cases for particulate and sliced foods. The expendable half-sized steam table pans are filled using filler hoppers where the product is mostly liquid. Otherwise, these containers are filled by hand using different utensils (dippers/ladles) depending upon the item. The cover can be sealed with a lidding machine or by hand. A shrink film or plastic bag can be used to cover some items.

3. All items processed in the Ingredient Preparation Activity are labeled with information concerning the date produced, item nomenclature, any special handling requirements, and expiration date of shelf life. A simple label printing machine prints this data on the labels, which are affixed by hand.

4. Alternative packaging materials are available for use in IPA. Poly-coated, oven-heatable cardboard and plastic types of containers may be used for packaging most IPA products which do not require closed atmosphere. Discussion of alternative packaging costs is at Inclosure 8.



SECTION V  
PRODUCT STORAGE, STAGING AND SHIPPING

1. Due to the limited storage life of items produced in the IPA, no more than a seven day storage space is required. Because of the rapid movement of these items, packaged products are stored in totes or racks, and placed either on pallets or carts for direct movement to dining facilities in accordance with the TISA ration issue schedule. All carts destined for particular dining facilities or groups of dining facilities are assembled and loaded onto refrigerated trucks for transport to the dining facilities. The IPA shipping area should accommodate two trucks at a time, each capable of supporting four to six dining facilities on each delivery. Either a daily issue for highly perishable items or the normal 2-2-3 ration issue frequency, as used at most Army installations, will be applicable. At the dining facilities, TISA distribution personnel unload the full carts and simultaneously reload empty carts. Totes and any packaging equipment from previous deliveries are also returned to the Ingredient Preparation Activity where they are off-loaded into the equipment-wash area.

2. Shelf life of IPA type items, as recommended by the TSA and Fort Lee Veterinary Staff, are shown:

High Risk Items - Consumption Within 36 Hours

Salisbury Steak	Diced Ham
Meat Loaf	Sliced Ham
Meatballs	Sliced Bologna
Sliced Bacon	Sliced Salami
Seafood Cocktail Sauce	Tartar Sauce

Medium Risk Items - Consumption Within 96 Hours

Diced Cheddar Cheese	
Sliced American Cheese	
Cabbage (diced/shredded/chopped)	Celery (shredded/diced)
Lettuce (shredded)	Peppers (shredded/diced)
Carrots (shredded/diced)	Onions (diced)

Low Risk Items - Consumption Within Days Shown

Potatoes (peeled/sliced/diced/shredded) 8 days  
All Gelatin Salads ~ 15 days  
Three Bean Salad (marinated) 15 days



ITEMS PREPARED IN INGREDIENT PREPARATION ACTIVITY

NOW PRODUCED

SAUCES

Seafood Cocktail  
Chili Mustard  
Tartar

POTATOES

Diced  
Peeled  
Shredded  
Sliced

SHREDDED SALAD INGRED

Carrots  
Cabbage  
Celery  
Lettuce  
Peppers, Green

CHOPPED SALAD INGRED

Cabbage

DICED SALAD INGRED

Carrots  
Celery  
Onions  
Peppers, Green

GELATIN SALADS

Cherry Jello  
Cranberry & Pineapple  
Jellied Pear  
Jellied Fruit Cocktail  
Melba Mold  
Orange & Pineapple  
Peach Jello  
Pineapple & Pear  
Strawberry & Pineapple

MARINATED SALAD

Three Bean

MEAT & CHEESE ITEMS

Sliced Bologna  
Diced Cheddar Cheese  
Diced Ham  
Sliced Ham  
Meatballs  
Salisbury Steak  
Meat Loaf  
Veal Loaf  
Sliced Bacon

BREADCRUMBS

POSSIBLE PRODUCTION

Soups  
Stew & Lasagna  
Pizza Sauce  
Bar-B-Que Sauce

French Fries  
Sandwiches  
Panned Sausage  
Baking Potatoes (Foil Wrapped)

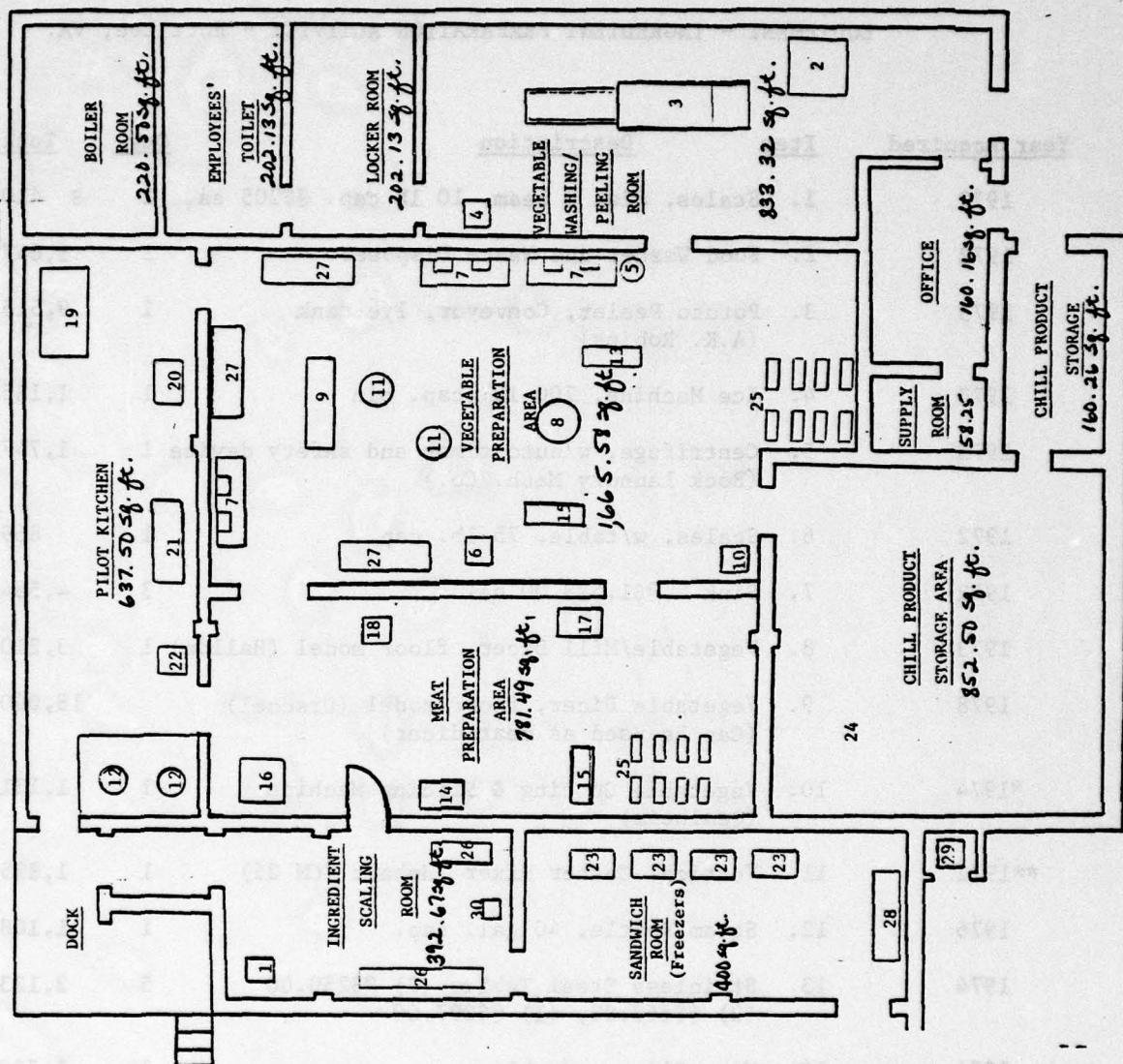


Inclosure 2

INGREDIENT PREPARATION ACTIVITY

1. Scales
2. Food Washer
3. Potato Peeler
4. Ice Machine
5. Centrifuge
6. Table w/Scale
7. Sink
8. Halide Dicer
9. Urschel Dicer
10. Qualheim
11. VCM (2)
- \* 12. Steam Kettle
13. Stainless Steel Table
14. Table w/Meat Slicer
15. Meat Slicer-Floor
16. Meat Mixer
17. Meat Former (Meatballs)
18. Molding Machine
- \* 19. Convection Oven
- \* 20. Lidding Machine
- \* 21. Fill/Clos Machine
- \* 22. Tipper Tie
23. Freezer
24. Cooler
25. Wire Baskets
26. Storage Cabinets
27. Pan & Storage Racks
28. Blower Unit
29. Condenser Unit (for Refrig.)
30. Hand Sink

\* Equipment in Pilot Kitchen





## EQUIPMENT - INGREDIENT PREPARATION ACTIVITY - Fort Lee, VA.

<u>Year Acquired</u>	<u>Item</u>	<u>Description</u>	<u>Qty.</u>	<u>Total Cost</u>
1972	1.	Scales, dial & beam, 10 lb cap. @\$205 ea.	2	\$ 410.00
1972	2.	Food Washer and Waste Disposer	1	1,647.00
1973	3.	Potato Peeler, Conveyor, eye tank (A.K. Robins)	1	9,515.00
1973	4.	Ice Machine, 700 lb. cap. bin	1	1,135.00
1973	5.	Centrifuge, w/auto timer and safety device (Bock Laundry Mach. Co.)	1	1,747.00
1972	6.	Scales, w/table, 75 lb. cap.	1	869.00
1972	7.	Sink @\$1,528.00 ea.	3	4,584.00
1973	8.	Vegetable/Mill Dicer, floor model (Hallde)	1	3,210.00
1978	9.	Vegetable Dicer, floor model (Urschel) (Can be used as meat dicer)		18,000.00
*1974	10.	Vegetable Cutting & Slicing Machine (Qualheim)	1	1,131.00
**1972	11.	Vertical Cutter Mixer (Hobart VCM 25)	1	1,895.00
1976	12.	Steam Kettle, 40 gal. cap.	1	1,108.50
1974	13.	Stainless Steel Tables (2) @\$250.00 (2) @\$663.00, (1) @\$297.00	5	2,123.00
1974	14.	Meat Slicer w/table	1	1,730.00
1972	15.	Meat Slicing Machine floor model (U.S. Berkel, Model 170G5) @ \$2,668.00	2	5,336.00
1976	16.	Mixer, meat, portable w/cover, electric	1	1,506.00
1973	17.	Moulding Machine, Meat & Fish	1	1,430.00
1973	18.	Moulding Machine, Meat & Fish w/conveyor (Hollymatic 4000A)	1	7,471.00
	N/A 19.			
	N/A 20.			
*1973	21.	Filling and Closing Machine	1	3,896.00

Inclosure 3

A-12



## EQUIPMENT - INGREDIENT PREPARATION ACTIVITY - Fort Lee, VA. (Cont.)

<u>Year Acquired</u>	<u>Item</u>	<u>Description</u>	<u>Qty.</u>	<u>Total Cost</u>
*1976	22.	Tipper Tie Machine	1	\$ 770.00
	N/A	23.		
	N/A	24.		
1972	25.	Wire Baskets @ \$42.50 ea.	32	1,360.00
**1973	26.	Storage Cabinets @ \$663.00 ea.	3	1,989.00
1977	27.	Pan and Storage Racks @ \$117.25 ea.	6	703.50
	N/A	28.		
	N/A	29.		
1972	30.	Hand Sink	1	1,000.00
1977	31.	Label Printing Machine (Weber)	1	550.00
*1973	32.	Can/Bottle Crusher	1	5,989.00
1977	33.	Can Opener, elec. @ \$82.00 ea.	3	246.00
1977	34.	Vegetable Trimmer	1	360.34
1974	35.	Cleaner, Spray, Auto, Water-Powered Mounted to wall @ \$130.00	3	390.00
1972	36.	Hand Trucks @ \$218.00	3	654.00
***1973	37.	Air Curtains @ \$355.88 ea.	5	1,779.40

NOTE:      \* Eliminate in its' entirety  
              \*\* Change quantity to one (1)  
              \*\*\* Change quantity to two (2)

OFFICE EQUIPMENT:	Desk	\$ 86.00
	Calculator	607.00
	Filing Cabinet	85.00
	Typewriter	441.00
	Water Fountain	199.00



(Boone (v. Moran))



15 March 1979

## MEMORANDUM FOR RECORD

SUBJECT: Ingredient Preparation Area Square Footage

1. The following is maximum square footage estimated as required for Ingredient Preparation Area without CFPF.

AREA	FORT LEE		FT	FT	FT
	CURRENT	REQUIRED	CARSON	LEWIS	KNOX
Admin (1)	844	600	600	700	700
Vegetable Washing & (3) Peeling	833	600	600	600	600
Vegetable/Salad (4) Preparation	1666	1500	1500	1600	1600
Meat Preparation (4)	781	800	800	800	900
Chill Storage (2)	1013	800	800	1000	1200
Raw Ingredients		(400)	(400)	(500)	(600)
Finished Products		(400)	(400)	(500)	(600)
Dry Ingredient (3) Scaling/Storage	393	200	200	200	200
Other (Sandwich Room & (5) Pilot Kitchen)	1038	-	-	-	-
TOTAL SQUARE FEET	6568	4500	4500	4900	5200
Rations/Day		2500	3500	6000	8000

## NOTES:

(1) Administrative Area includes Office, Employee Locker, Break and Rest Rooms, Boiler Room, and Supply Room (no refrigeration requirement).

(2) Chill Storage should be at about 40°F. TISA Storage could be used if proximate and sufficient space is available, thus negating the requirement for this area. Separate chill area should be provided for raw ingredients and for finished products (50-50 split).

(3) Ingredient storage and vegetable washing and peeling areas would not require refrigeration.



DALO-TAE-D

15 March 1979

SUBJECT: Ingredient Preparation Area Square Footage

(4) Vegetable/salad preparation and meat preparation areas should be air conditioned/refrigerated to a constant temperature of about 55°F.

(5) Sandwich preparation (currently freezer room) and Pilot Kitchen areas of Fort Lee are not required for ingredient preparation operations.

2. The above are preliminary maximum estimated ingredient preparation area requirements. The actual space may vary considerably depending on the facility available and items produced.



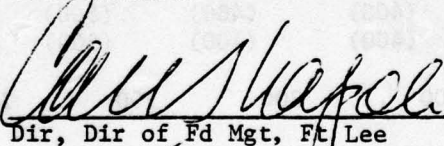
JAMES E. TURNER

LTC, GS

Chief, Systems Development Division  
Concepts and Systems Directorate

1 incl: <sup>T</sup> Ipa Layout

COORDINATION:

 21 MAR 79  
Dir, Dir of Fd Mgt, Ft Lee DATE

 16 MAR 79  
Veterinary Staff Office, TSA DATE



ITEM	EQUIP. NEEDED	MFG.	MODEL	COST	FT. LEE 2000	QUANTITY			FT. KNOX 8000
						FT. CARSON 3808	FT. LEWIS 6204		
Potato, Whole Baked Diced Sliced Shredded	Washer Peeler Dicer Shredder] Slicer	Groen Hobart Berkel Qualheim	GA(D)-1 6460 RG-2B 101	\$10,500 1,650 2,300 2,750	1 1 1 1	1 1 1 1	1 2 2 1	1 2 2 1	
Carrots, Shredded Celery, Shredded Peppers, Shredded Cabbage, Shredded Lettuce, Shredded Cabbage, Chopped	Washer] Peeler] Shredder  Chopper	SAME UNITS AS ABOVE Qualheim Berkel	440 RG-6	1,000 5,900	1 1	1 1	2 1	2 1	
Carrots, Dicer Peppers, Gr, Dicer Onions, Dicer Celery, Dicer Cheese, Cheddar Ham, Cheddar	Washer] Peeler]  Dicer ]	SAME UNITS AS ABOVE							
Bacon, Slab Ham Cold Cuts	Slicer " "	Berkel " "	180D	6,500	1	1	1	1	
Sauce, Pizza BBQ	Steam Kettle	Groen	DL30	1,740	1	1	1	1	
Meatballs, Swedish Spaghettl	Mixer Moulder	Hobart Qualheim	D300 400	2,365 1,000	1 1	1 1	1 1	1 1	
Meatloaf	Mixer	Hobart	D600T	4,000	1	1	1	1	

39,705 39,705 44,655 44,655



# PACKAGING

18 x 24  
Plastic  
Bags

Aluminum  
Half Sized  
Steam Table Pans

Half Sized  
Aluminum  
Sheet Pans

Potatoes - All 25 lbs.  
Sliced  
Diced  
Whole  
Shredded

All Jello Salads (w/lid)  
Sliced Bologna  
Meat Loaf  
Sliced Ham  
Three Bean Salad

Meatballs  
Salisbury Steak

All vegetables]  
Diced cheese ] 5 lbs.  
Diced ham ]

## Heavy duty sheet pans from Dining Facility

Bacon, sliced

Meats require both pans and plastic bags. Bags are slipped over the  
panned meats.



DALO-TAE-D

MEMORANDUM FOR CHIEF, SYSTEMS DEVELOPMENT DIVISION

SUBJECT: Report of Packaging Material Cost Estimates for Ingredient Preparation Activity from NARADCOM

1. References:

a. Section V, Conclusions, User/Operator Evaluation; Ingredient Preparation Activity (IPA) After Action Report, dated 23 May 1979.

b. FONECON, Fred Costanza, NARADCOM, and Mr. R.L. Helmer, TSA, 18 Jun 79.

2. Fort Lee suggested that the use of aluminum pans for packaging IPA products should be further reviewed with the view toward obtaining a suitable substitute at a lesser cost (ref 1a).

3. NARADCOM was asked to conduct this review and provided the following material cost (ref 1b):

a. Aluminum Half-Size Steam Table Pans: (approximately 9-1/2" x 12" x 1-3/4")

Pan Cost	22 Cents
Lid Cost	<u>11 Cents</u>
Total Cost	33 Cents

b. Cardboard Containers:

The cardboard containers require the purchase of a \$20,000 machine to form the cardboard pan equal in size to the aluminum pans and a \$50,000 machine to seal cardboard pans. The material costs only are broken into two types as follows:

Type 1	- Polycoated oven heatable cardboard:	Pan Cost	32 Cents
		Lid Cost	<u>9 Cents</u>
		Total Cost	41 Cents
Type 2	- Nonheatable Cardboard:	Pan Cost	12 Cents
		Lid Cost	<u>5 Cents</u>
		Total Cost	17 Cents



DALO-TAE-D

21 June 1979

SUBJECT: Report of Packaging Material Cost Estimates for Ingredient Preparation Activity from NARADCOM

c. Polymeric, polypropylene and polyester formed pans with the following dimensions (5" by 4" by 1-1/4"). NOTE: This is much smaller than the aluminum pan.

Material cost with lid	Polymeric	10 Cents
	Polypropylene	12 Cents
	Polyester	18 Cents

The machine required to form the above material cost \$93,600.

3. In addition to the above items, information was obtained from Irvinware on ovenmate products which are made up of paperboard coated with heat resistant polyester. The largest item available was an 8" by 5-3/4" pan (about 1/2 of a half-sized steam table pan) at a cost of about \$.06 per pan in orders over 10,000 pieces (lids were not available for these pans).

4. In conclusion, NARADCOM was not able to provide a lower cost packaging material than the disposable aluminum pans at 33 cents total cost per pan, when overall labor, machine and material costs were considered. However, smaller size pans are available at less overall cost for equivalent size; therefore, reduction of overall packaging costs are probably achievable.

  
RICHARD L. HELMER  
Food Technologist



ANNEX B

USER/OPERATOR EVALUATION

INGREDIENT PREPARATION ACTIVITY (IPA)

AFTER ACTION REPORT

(Prepared and Submitted by  
Fort Lee, Food Service)



## TABLE OF CONTENTS

SECTION I	SUMMARY
SECTION II	INTRODUCTION
	1. PURPOSE
	2. SCOPE
	3. BACKGROUND
	4. OBJECTIVES
SECTION III	CONDUCT OF EVALUATION
SECTION IV	OBSERVATIONS AND FINDINGS
	1. STAFFING ADEQUACY OF IPA
	2. IMPACT OF IPA ON DISTRIBUTION AND STORAGE REQUIREMENTS
	3. REQUIREMENTS FOR AND ADEQUACY OF PRODUCTION PLANNING, SCHEDULING AND CONTROL SYSTEM
	4. ADEQUACY OF PROCEDURES FOR ACCOUNTING FOR SUBSISTENCE TRANSFERRED BETWEEN THE TISA AND IPA
	5. IMPACT OF IPA ON INSTALLATION STOCK FUND AND ARCS
	6. SKILL LEVEL REQUIREMENTS FOR IPA FUNCTIONS
	7. PROBLEMS ENCOUNTERED WITH MILITARY SUBSISTENCE SUPPLY SYSTEM
	8. IPA OPERATIONAL GUIDES
	9. ADEQUACY OF PRESENT DINING FACILITY EQUIPMENT TO SUPPORT IPA OPERATIONS
	10. REQUIREMENTS FOR TRAINING AND ADVANTAGES AND DISADVANTAGES OF ROTATING MILITARY FOOD SERVICE PERSONNEL BETWEEN THE IPA AND THE DINING FACILITIES FOR TRAINING



## SECTION I

### SUMMARY

1. Fort Lee provided Department of the Army with the physical facility and personnel required to operate an Ingredient Preparation Activity (IPA) for the purpose of evaluating this concept as to its viability for potential establishment at other installations in whole or part, as a command option.
2. The operation of the IPA was essentially a continuation of the mission which it performed in support of the Central Food Preparation System evaluation, less those functions performed for the central kitchen. During the evaluation period of 2 January through 30 April 1979, the IPA produced 538,936 servings in support of 757,130 meals served in Fort Lee dining facilities. This was accomplished initially by a staff of seven personnel which was subsequently reduced to six (three cooks and three food service workers). The productivity rate will jump significantly now that a supply source for slab bacon has been established by the Defense Personnel Support Center and will become more readily available to the IPA for slicing and shingling as a convenience to dining facilities at a lesser cost than regular, sliced bacon.
3. The IPA is strongly supported by dining facility managers with the consensus that it remain in operation. The IPA, by its performance of those numerous, time consuming tasks required in preparing food items for cooking and/or serving in the dining facilities frees both cook and food service worker employees in the dining facilities to perform other essential tasks including the big one of sanitation. This is particularly pertinent to Fort Lee which has fewer dining facility personnel than what has been officially recognized as required by the recent US Army Training and Doctrine Command (TRADOC) manpower survey.
4. Based upon these and other factors, it is recommended that the IPA at Fort Lee remain operational at least through such time that the US Army Troop Support Agency (TSA) has compiled all evaluation results from each of the separate organizations and activities supporting the evaluation and has made a determination as to the viability of the IPA concept for establishment at Army installations.



## SECTION II

### INTRODUCTION

1. Purpose: To provide an operational environment for the conduct and evaluation of an IPA and assist in the evaluation of this system from the perspective of the user/operator.

2. Scope: The IPA, for purposes of this evaluation, consists of the facility in which central support was performed (building P-7118C, Fort Lee, Virginia) and those equipment items listed at TAB C.

3. Background:

a. In November 1970, the Chief of Staff of the Army established the Department of the Army Subsistence Operations Review Board to investigate the adequacy of the Army food service system and to develop an effective, efficient, and economical system. The board observed that many of the deficiencies found were caused by the use of small, inefficient, and independent food preparation facilities operated, in many cases, by unqualified personnel under minimal supervision.

b. Natick Laboratories tested the central food preparation concept at Fort Lewis, Washington, where these initial studies indicated that a Central Food Preparation Facility (CFPF) would be cost effective, reduce manpower requirements, and increase customer acceptance. The IPA was an element of the CFPF. In 1973, Army officials advised the Investigative Staff for the Committee on Appropriations, US House of Representatives, on Department of the Army FY 1974 Military Construction Program that in order to further evaluate the CFPF experiment at Fort Lewis, the Army was in the process of installing an interim CFPF system at Fort Lee, Virginia.

c. Due to difficulties encountered with the building selected to house the CFPF, another site had to be selected and some preferences had to be sacrificed. One of the primary changes made from the original CFPF design concept was that the IPA was housed in a separate building about 200 yards from the central kitchen. The IPA in building P-7118C began operation in April 1975 and has operated continuously since that date. Initial processing was of



vegetable and gelatin salads, with additional items added as time progressed, including such items as meatballs, meat and veal loafs and Salisbury steak. Until the CFPF began operation, all items were sent fresh to dining facilities. With the opening of the CFPF, other functions were added, including processing of meats and vegetables for cooking in the CFPF and weighing and scaling of ingredients for CFPF products.

d. Since the IPA was in a separate facility, some separate data collection on the IPA was accomplished during the CFPF evaluation. With this information, and with data on ingredient preparation-type items collected at Fort Lee and Fort Eustis prior to the CFPF operation along with further data to be collected, a determination can be made as to the advisability and potentialities of this type operation for other Army installations.

4. Objectives: To provide those facilities, personnel and resources necessary to establish an IPA, to operate the IPA in accordance with the Evaluation Plan (inclosure 1 to US Army Troop Support Agency (TSA) Memorandum, dated 14 February 1979, subject: Evaluation of the Ingredient Preparation Activity), and to submit to TSA a user/operator report relative to the operation (TAB A).



### SECTION III

#### CONDUCT OF EVALUATION

1. The IPA operation during the evaluation period was in accordance with Section IV, inclosure 1, Evaluation Plan, to TSA Memorandum, dated 14 February 1979, subject: Evaluation of the Ingredient Preparation Activity; and the Concept of Operations, Ingredient Preparation Activity, inclosure 2, thereto.

2. The day to day functions of the IPA were maintained throughout the evaluation period of 2 January through 30 April 1979. This represented a continuation of functions for which the IPA was responsible in support of the CFPF through its final production day of 8 March 1979. Thereafter, the IPA mission reverted to that of supporting only the installation dining facilities with centrally processed salads, salad ingredients, sauces, breadings materials, and certain meat and cheese items. With the reduced scope of IPA mission, the staffing, which is discussed in Section IV, was reduced commensurately.



## SECTION IV

### OBSERVATIONS AND FINDINGS

1. Staffing Adequacy of IPA. The Ingredient Preparation Facility was initially staffed with one E-8, NCOIC; one E-6, First Cook; one E-5, Senior Cook; one WG-8, Cook; one WG-2, Food Service Worker; and two WG-1, Food Service Workers. Later staffing of the activity, however, deleted the E-8, NCOIC, position with the First Cook serving as the NCOIC. Six individuals composed of the grades aforementioned are considered adequate for this type operation for an installation the size of Fort Lee.
2. Impact of IPA on Distribution and Storage Requirements. The operation of the IPA has had little impact on distribution and storage requirements. These functions are performed by the Troop Issue Subsistence Activity (TISA). All products prepared in the IPA are stored within the IPA's refrigerated storage room until such time they are scheduled for normal delivery along with other subsistence items supplied by the TISA. The items are delivered in accordance with regularly scheduled TISA deliveries; i.e., Monday, Wednesday, and Friday. Although many of the IPA food items required special handling, e.g., jello, sliced bacon, and meat loaf, these items are prepared for transport in suitable racks for delivery on the TISA vehicles. There has been no significant transporting difficulties with IPA products to the dining facilities. There has also been little impact regarding storage of IPA products in dining facilities.
3. Requirements for and Adequacy of Production Planning, Scheduling, and Control System. As in any high volume food production operation, there is a requirement in the IPA for production planning, scheduling, and control. This was accomplished in the Fort Lee IPA by using three different DA Forms 3294, Field Ration Issue Slip, for Monday, Wednesday, and Friday issue days. Each issue slip was slightly different in that certain IPA products were offered for issue only on those days. The more popular, or more frequently required items, e.g., potatoes, onions, cabbage, lettuce, cheeses, and cold meats, were offered on either two or all three issue days. Shelf life of the products was also considered in determining the frequency with which they appeared on the issue slips. This system provided for prior planning of daily production on a weekly basis. This cyclic-type production/issue schedule also made it more convenient for the TISA in both ordering ingredients and in planning for deliveries to dining facilities. As a general production overview of the IPA, Mondays, Wednesdays, and Fridays were the production



days for vegetables, cold meats, cheeses, sauces, and gelatin salads. Ground meat items (meatballs, salisbury steak and meat loaf ) and bacon, which are more labor intensive, were scheduled for Tuesday and Thursday production. Also, on these two days certain pre-production tasks were performed in preparation for the other three days' production. This system worked very well and provided all necessary support to the dining facilities.

4. Adequacy of Procedures for Accounting for Subsistence Transferred Between the TISA and IPA. The subsistence accounting procedures used were considered adequate for the transfer of subsistence items between the TISA and IPA. These procedures consisted essentially of the ordering of ingredients for the IPA from the TISA on DA Form 3161 and transferring the finished product back to the TISA on DD Form 1149. A register for the IPA was maintained to record all receipts (DA Form 3161) as debits and all returns to TISA (DD Form 1149) as credit entries.

5. Impact of IPA on Installation Stock Fund and ARCS.

a. There was no impact on the installation stock fund resulting from the operation of the IPA.

b. There was no significant impact upon the ARCS at Fort Lee insofar as dining facility financial postures were concerned. Although the master menu was deviated from with regard to salads and jello prescribed, a wide variety of these type items was available for selection on DA Form 3294 on which Food Service Sergeants requisitioned subsistence items from the TISA. A list of products prepared in the IPA is at TAB B.

6. Skill Level Requirements for IPA Functions. The basic skill levels represented by the grades currently used in the IPA are considered adequate.

7. Problems Encountered with Military Subsistence Supply System. There were no significant problems encountered with regard to the quality of raw ingredients received as a result of using the military subsistence supply system.

8. IPA Operational Guides. The operational guides used by IPA personnel, for the most part, were adequate.

9. Adequacy of Present Dining Facility Equipment to Support IPA Operations. There was little impact on existing dining facility equipment as a result of IPA operations. Equipment currently authorized by CTA 50-911 is adequate to process IPA products within a dining facility.



10. Requirements for Training and Advantages and Disadvantages of Rotating Military Food Service Personnel Between the IPA and the Dining Facilities for Training.

a. Requirements for Training. Very few of the equipment items used for production in the IPA are CTA 50-911 equipment items normally found in a typical dining facility. The IPA equipment is high speed, high production, state-of-the-art equipment which requires special care and training of personnel in operating. A training program in the proper and safe operation of each piece of equipment prior to startup of operation in the IPA is definitely required.

b. Advantages and Disadvantages of Rotating Military Personnel into the IPA.

(1) Advantages.

(a) Familiarization with new, state-of-the-art, high production equipment.

(b) Training in high volume food preparation.

(c) Enhance career/professional development by exposure to centralized food preparation operations.

(d) Enable cook personnel to receive concentrated training on the type of items produced in the IPA thereby becoming exceptionally proficient in these type items.

(2) Disadvantages.

(a) The most skilled and proficient personnel available would not always be preparing the IPA products utilized in installation dining facilities.

(b) The training period required for new personnel would be non-productive time spent in the IPA. With the already small staff in the IPA, this could possibly present a shortfall of personnel to perform the work.

11. Apparent Advantages/Disadvantages of Direct Hire KP's Versus Contract KP's in Staffing an IPA.

a. Direct Hire KP's - Advantages:

(1) Same work force in the facilities each day which would facilitate specialized training in the operation of specific items of equipment.



(2) Work force under direct supervision of the individual in charge of the facility; direct communication with the employees.

(3) Better esprit among the work force by always knowing what their individual jobs are and where they would be located (as opposed to being shifted around from one job or location to another).

b. Direct Hire KP's - Disadvantages:

(1) If an employee is absent, there is no replacement to do that person's work.

(2) Administrative actions pertaining to employees are the responsibility of the supervisor, time consuming, and not directly related to production.

c. Contract KP's - Advantages:

(1) Supervision of employees is performed by contractor; more time is made available to supervisor for other duties.

(2) Contractor responsible for training of personnel and insuring sufficient personnel is always present to perform the required tasks.

d. Contract KP's - Disadvantages:

(1) Specialized work to be performed would require the contractor to have several employees so qualified and would be costly to contract for.

(2) In the strictest sense, no direct supervision of employees is authorized the supervisor in charge of the facility. All such coordination must go through the contractor's representative or the contractor himself.

(3) All work to be performed must be included in the contract specifications because it is difficult to get employees to perform required tasks which are not in the contract and there is no direct operational control over the employees.

12. Equipment Performance Including Preference, Shortcomings, Ease of Operation and Reliability. A listing of equipment used in the IPA is attached at TAB C. All of the items operated very satisfactorily with little maintenance problems being incurred.



There was a problem, however, with one of the two floor-type slicing machines and one of the two vertical cutting machines (VCM) with regard to sanitation. These two machines registered high bacterial counts when in use for an extended period of time and required special cleaning at frequent intervals (every 20 minutes) of use.

13. Adequacy of Packaging. The present system used in packaging IPA products provides for aluminum pans with paper/foil lids being used for sauces and gelatin salads. Aluminum pans without lids are also used for transporting meat items such as meatballs, Salisbury steaks, and formed meat loaves. Plastic, heavy-duty bags are used for packaging vegetable items, sliced bacon, and diced cheeses and meats. The use of the aluminum pans is not considered to be the most cost effective type of container that could be used for these products. Should the cost of these containers ever be incorporated into the price of the IPA products, particularly under the ARCS system, it would be very expensive for purchase by dining facilities. Less expensive packaging materials should be explored in order to reduce this element of cost in operating an IPA.

14. Waste Disposal Problems Incurred. Waste disposal problems in the operation of the IPA were considered minimal.

15. Impact of 42-Day Master Menu on IPA Operations. IPA production is based principally upon preparing centrally those menu items prescribed in the 42-Day Master Menu which are appropriate for IPA production. Some deviation from the menu was implemented, however, by Installation Menu Board action, to enable the IPA to operate more efficiently. A fixed "shopping list" of the most popular gelatin salads was established for use by dining facility personnel in ordering these items. This list offers a wide variety of gelatin items, yet, by it being limited to the most popular types, better facilitates the ordering of ingredients and production planning. To insure variety in the dining facilities, different gelatins (from the shopping list) are offered on the issue slips for Monday's, Wednesday's, and Friday's issues to the dining facilities. In addition, so as not to overload the IPA on certain days of the week, ground meat items (meatballs, Salisbury steak, meat loaves) are processed on Tuesdays and Thursdays with consumption scheduled for Wednesday and/or Friday. The 42-Day Master Menu has no other impact upon IPA operations.

16. Shortcomings or Problems with the Physical Facility. The Ingredient Preparation Facility was located in an old meat cutting facility next to the TISA Cold Storage Plant. Although this location was ideal for the movement of perishable items into the IPA, the old meat cutting plant's configuration does not provide the



proper facilities to establish good work flow for the ingredient preparation task. The shipment of prepared salads and formed, uncooked meats for direct shipment to dining facilities, created, in some cases, cross-flow through the IPA. The flooring in the Ingredient Preparation Facility is quarry tile, which is extremely slippery when wet. The flooring under the Lye Potato Peeler constantly wears away from lye drippings. When the Lye Potato Peeler was installed, a floor which would be resistant to lye should have been installed and suitable drains installed to insure that the drainage of lye mixture would rapidly and safely occur. At the time the building was renovated, a pot and pan washing system was not installed; therefore, pots and pans were washed by hand. The renovation of the facility to house the Ingredient Preparation Facility was accomplished with the view toward economizing wherever possible since this was intended only as an interim operation. Due to this, some undesirable features in the plant were not eliminated such as overhead meat railings throughout the facility. This creates cleaning problems. An IPA should have separate rooms for meat preparation and vegetable preparation and sufficient chill space for the tempering of meats.

17. Operational Responsibility for the IPA. Operational responsibility for the IPA at Fort Lee was assigned to the Subsistence and Food Service Branch, Supply and Services Division, Directorate of Industrial Operations. All six personnel employed at the IPA (two military and four civilians) are assigned to the Quartermaster Brigade. These cook and food service worker personnel would normally be assigned to Brigade dining facilities if the IPA were not operated. The Subsistence and Food Service Branch supervises the operations of the Troop Issue Subsistence Activity (TISA), the Installation Food Service Office, and the IPA. The Chief, Subsistence and Food Service Branch, is also the installation Food Adviser. The Subsistence and Food Service Branch was assigned operational responsibility for the IPA because of its functional relationship to the TISA. All food ingredient stocks in the IPA are the property of the TISA through their return to the TISA in the form of finished products ready for issue. Quantities to prepare are based upon requests (DA Form 3294) to the TISA from the dining facilities. In essence, the IPA is an arm of the TISA. Operational control, however, is relinquished to the Food Adviser because of certain technical skills required in supervising the IPA which are not available in the TISA. By agreement between the Director of Industrial Operations and the Commander, Quartermaster Brigade, Brigade personnel are loaned to the Directorate of Industrial Operations to perform the IPA functions. This arrangement worked very well during the IPA evaluation. It is essential, however, that if an IPA is established with personnel detailed to the Directorate of Industrial Operations to perform the work, any agreement or



Memorandum of Understanding must specify that the IPA staffing will be maintained at the prescribed staffing level at all times. To do otherwise would jeopardize the capability of the IPA to maintain performance of its mission.

18. Mobilization Impact. It is estimated that the Fort Lee IPA is adequate for this installation and would perform an invaluable role in the event of mobilization. Any situation requiring mobilization, other than selective mobilization, will be of sufficient gravity as to require emergency expansion of the peacetime support base. Food service operations are no exception. Expanded subsistence support must be provided to Active Component, mobilized RC units, and activated AUS units within hours/days of the mobilization alert order. The production capacity of the Fort Lee IPA could be substantially expanded, as required, by increasing the labor force, extending the work week to two 10-hour shifts, and/or simplifying the menu to emphasize more items which lend themselves to high volume central IPA production. In the case of the latter, increasing the number of times IPA supported items are served would reduce the work load in the dining facilities and allow more time to prepare non-IPA menu items for the expected increased headcount. This would be considered an acceptable change to feeding procedures under mobilization conditions as it would greatly increase feeding efficiency by eliminating the requirement to produce a multiplicity of items in small lot sizes to satisfy the expansive 42-day Master Menu. By implementing the aforementioned steps, it is estimated that IPA production could be expanded from three to four times the previous capacity. Such expansion would greatly enhance the responsiveness and posture of the food service program at an IPA supported installation during mobilization.



## SECTION V

### CONCLUSIONS

1. The operation of the IPA demonstrated explicit benefits to be accrued principally in the form of freeing dining facility personnel from performing time-consuming tasks which would enable them to devote more time to sanitation and other required tasks, to achieve high quality uniformity on salad preparation, and to reduce trim loss in processing vegetables.
2. The staffing of the IPA consisting of one E-6, First Cook; one E-5, Senior Cook; one WG-8, Cook; and three Food Service Workers is adequate for the troop feeding strength of an installation the size of Fort Lee.
3. All equipment provided the Fort Lee IPA performed satisfactorily.
4. The use of aluminum pans for packaging IPA products should be further reviewed with the view toward obtaining a suitable substitute at a lesser cost.
5. The present IPA facility requires modification to improve sanitation standards and to provide for better floor drainage.
6. Dining facility managers at Fort Lee desire that the IPA operation continue to provide support to installation dining facilities.



SECTION VI

RECOMMENDATIONS

1. That the IPA at Fort Lee remain operational through such time that the TSA has compiled all evaluation results from each of the separate organizations and activities supporting the evaluation and has made a determination as to the viability of the IPA concept for establishment at Army installations.
2. That suitable alternatives to present packaging techniques of utilizing aluminum foil pans be explored with the view toward obtaining less expensive packaging materials.



14 February 1979

MEMORANDUM FOR: DIRECTOR, DIRECTORATE OF FOOD MANAGEMENT, FORT LEE

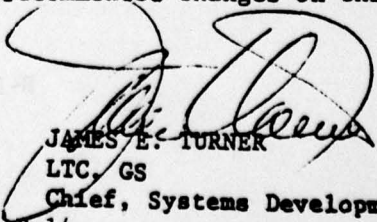
SUBJECT: Evaluation of the Ingredient Preparation Activity

1. Attached at Incl 1 is draft Evaluation Plan for the Ingredient Preparation Activity. Although we have already started our evaluation, I would appreciate your comments related to the areas addressed. I would especially like you to identify any areas that you or your personnel feel should be added or modified in order to provide a good evaluation of the Ingredient Preparation concept.
2. Related to your support of this evaluation, there are several things that must be done:
  - a. Order slab bacon for processing in the Ingredient Preparation Activity and notify TSA when you are ready to start processing this bacon centrally.
  - b. Once the authorization to terminate the CFPF operation is received, reduce the staff in the Ingredient Preparation as fast as possible in order that we may conduct whatever work measurement we need in that activity.
  - c. Insure the Ingredient Preparation Activity is following the operational procedures established for the particular products that they process and using proper equipment to accomplish same. We need your personnel to review the operational procedures and provide updated, accurate procedures to us as soon as possible.
  - d. Begin processing lettuce centrally unless there is a major objection from the Veterinary inspectors to this operation.
  - e. If dining facility workloads permit, prepare such items as Salisbury Steak, Meatballs and Meat Loaf for direct shipment from Ingredient Preparation to the dining facility. This will allow us to measure and add the times and other data in dining facilities for these products to that for the Ingredient Preparation operation.
3. Also attached is a draft Concept of Operations for the Ingredient Preparation Activity, modified to fit Fort Lee, which will be part of the final report. Your comments or recommended changes on this are also needed.

2 Incl

as

(Incls not included)

  
JAMES E. TURNER

LTC. GS

Chief, Systems Development Division

B-14



LIST OF INGREDIENT PREPARATION ACTIVITY PRODUCTS

Sauces

Seafood Cocktail  
Chili Mustard  
Tartar

Potatoes

Shredded  
Diced  
Peeled  
Sliced

Shredded Salad Ingredients

Peppers, Green  
Carrots  
Cabbage  
Celery  
Lettuce

Chopped Salad Ingredients

Cabbage

Diced Salad Ingredients

Peppers, Green  
Carrots  
Celery  
Onions

Marinated Salad

Three Bean

Bread Crumbs



Gelatin Salads

Cherry Jello  
Peach Jello  
Cranberry and Pineapple  
Jellied Pear  
Jellied Fruit Cocktail  
Melba Mold  
Orange and Pineapple  
Pineapple and Pear  
Strawberry and Pineapple

Meat and Cheese Items

Diced Cheddar Cheese  
Sliced Bologna  
Diced Ham  
Sliced Ham  
Sliced Bacon  
Meatballs  
Salisbury Steak  
Meat Loaf



EQUIPMENT LIST FOR INGREDIENT PREPARATION ACTIVITY

Air Compressor  
Air Curtain (two each)  
Centrifuge, Crispin  
Dock, Unloading, Adjustable Ramp, 54" X 54"  
Dough Trough, Mobile, 26" X 40" X 20"  
Food Washer  
Food Waste Disposer  
Frozen Food Cabinet  
Ice Machine  
Kettle, Steam Jacketed, 40 gallon capacity  
Label Printing Machine  
Lye Conveyor, Elevator Type  
Lye Makeup Tank  
Meat Mixer  
Meat Slicer (two each)  
Meat Slicer, Counter Type  
Molding Machine  
Peeler, Potato, 2500 lbs/hr with Conveyor; Drain Type,  
Washer and Conveyor  
Racks, Roll-In, Aluminum  
Scale, Dial and Beam, Indicating, Counter Type, 75 lb  
capacity  
Scale, Dial and Beam, Indicating, Counter Type, 10 lb  
capacity  
Scale, Dial and Beam, Indicating, Floor Type, 200 lb  
capacity  
Scale, Dial and Beam, Indicating, Floor Type, 300 lb  
capacity  
ay Cleaning Unit  
Truck, Dish Type, Tub, Heavy Duty, Mobile, 45 gallon  
capacity  
Truck, Dough, Stainless Steel, Heavy Duty, 34½" X 24" X 22"  
Truck, Dough, Stainless Steel, 500 lb capacity,  
45" X 24" X 22"  
Urschel Slicer/Dicer  
Vegetable Cutter and Slicer (Halldé)  
Vegetable Cutting and Slicing Machine (Qualheim)  
Vertical Cutting Mixer  
Vegetable Trimmer



ANNEX C

ANALYSIS OF OPERATIONS



## ANNEX C

### INGREDIENT PREPARATION ACTIVITY OPERATIONAL ANALYSIS

#### SECTION I

#### INTRODUCTION

PURPOSE: To compare Ingredient Preparation Activity (IPA) and Dining Facility (DF) product preparation times in order to determine differences in labor requirements between the two types of facilities and potential manpower savings offered by IPA.

SCOPE: Evaluation sites were various dining facilities (DF's) at Forts Eustis and Lee and the Fort Lee IPA. Surveys were conducted 2 January - 21 May 79 on thirty-one items which are listed at Incl 1. For observational purposes, these items were divided into the categories of potatoes, salads (gelatin and marinated), meats and cheese, and vegetables. In most cases, at least four observations were obtained on each item. Surveying procedures included recording ingredient weights at the beginning and end of processing and the time, in minutes, required for each step of preparation. In order to compare IPA and DF preparation times, the total preparation times were converted to man-minutes for one hundred servings. Product yields were also computed and converted to one hundred servings. After conversion, preparation times and yields were used to compare the efficiency of central IPA to onsite DF preparation of these items.



## SECTION II

### PROCESSING PROCEDURES AND OBSERVATIONS

1. Processing procedures for each item can generally be grouped to cover all items in that particular category with subdivisions appearing where appropriate. These procedures are outlined for each group and subdivision and necessary explanations follow. Equipment utilized is also listed.

Manual labor is required for those procedures which do not have a corresponding piece of equipment and some manual labor may be used in conjunction with the equipment. Labels for all IPA items are printed in advance with the Label Printing Machine so that they need only to be applied by hand after packaging.

#### 2. POTATOES:

<u>Procedure</u>	<u>Equipment</u>
Peel and wash	Robins Lye Peeler
Remove eyes, spots, etc.	Paring Knife
Hold	Stainless Steel Tubs
Add antioxidant	
Weigh	Scales
Bag	
Dice and shred/slice	Urschel/Hallde
Tie	
Label	Label Printing Machine
Stack	Wire baskets
Refrigerate	

Fifty pound bags of potatoes are loaded into the bin of the potato peeler, a lye peeler and reel-type washer. A conveyor carries the potatoes into a bin which contains the lye solution. This solution, which is kept at 185-195°F, loosens the potato skins. The reel turns slowly, keeping the potatoes immersed in the lye solution for four to five minutes. Next, the potatoes go into the reel washer which has a fine spray of fresh water. This removes the loosened skins from the potatoes. Potatoes exit on another conveyor where they are



examined for spots, eyes, etc., and are trimmed by hand. From the conveyor, the potatoes are deposited into holding tubs of ice water. An antioxidant is added to the potatoes in the holding tub two to three minutes before bagging. All potatoes are packaged whole, 25 pounds to each bag. Weighing and bagging are simultaneous operations. Potatoes are bagged in a plastic bag resting on scales as it is filled. Potatoes to be issued whole are then tied and labeled. Diced, shredded, or sliced potatoes are processed from peeled, whole potatoes, one bag at a time to avoid reweighing. It is assumed that no weight loss is experienced during processing; i.e., 25 pounds of whole potatoes yield 25 pounds of diced, shredded, or sliced potatoes.

### 3. SALADS (Gelatin and Marinated):

#### Procedure

Heat water (gelatin only)  
Weigh/Measure Ingredients  
Open cans  
Mix  
Pan  
Lid  
Seal  
Label  
Stack  
Refrigerate

#### Equipment

Steam kettle  
Scales-quart dipper  
Can opener  
Stainless steel tub and spatula  
Quart dipper  
  
Label Printing Machine  
Wire baskets

Ingredients for salads are weighed and/or measured according to individual recipes. These ingredients are mixed manually in a stainless steel tub. The mixtures are panned into aluminum half-sized steam table pans with a quart dipper. Manual procedures of lidding through refrigeration follow.

### 4. MEATS AND CHEESE (Diced/Sliced Items):

#### Procedure

Preprocess (Manual)  
Dice/Slice  
Weigh  
Bag/Pan  
Tie/Lid and Seal  
Label  
Stack  
Refrigerate

#### Equipment

Halbde and VCM/Meat Slicing Machine (floor model)  
Scales  
  
Label Printing Machine  
Wire baskets



Diced/sliced items must first be preprocessed. This entails such steps as tempering bacon, cutting cheese into strips, and disinfecting and opening cans of ham. After preprocessing, the items are sliced or diced and packaged. Cheese is diced with the Halldé; ham is diced with the VCM. Bacon, bologna, and ham are sliced with the floor model meat slicer.

#### 5. FORMED MEATS:

##### Procedure

##### Equipment

Thaw meat	
Weigh/Measure Ingredients	Scales
Mix	Meat mixer
Form (Meat loaf-manually formed)	Moulding machine
Pan	
Wrap	
Stack	Wire baskets
Refrigerate	

Frozen meat for formed meat items is placed in the refrigerator for thawing. Additional ingredients are weighed and measured one day prior to processing. Since large amounts of ingredients are used, the recipe is divided into several batches for easier handling. Each batch is mixed in the meat mixer and then loaded into the moulding machine as required. Meat loaf is moulded by hand. After moulding, meatballs are sometimes rounded using another piece of equipment, the meat former.

#### 6. VEGETABLES:

##### Procedure

##### Equipment

Weigh	Scales
Trim	Electric trimmer, paring knife, or manual
Wash	Vegetable washer
Chop, Dice, Shred	Urschel
Add antioxidant	
Rinse	
Spin dry	Centrifuge
Weigh	Scales
Bag	
Tie	
Label	Label Printing Machine
Stack	Wire baskets
Refrigerate	



Vegetables are weighed out to an amount which exceeds the poundage required in order to allow for loss during trimming and processing. Trimming is performed manually on some items and manually and mechanically on others. Still, other items require only machine trimming. For example, green peppers are trimmed by hand only. The large outer leaves of cabbage and lettuce heads are removed manually; cores are removed with the electric trimmer. Celery and carrots require only machine trimming. All vegetables are washed in the vegetable washer after trimming. After processing, they are rinsed in an antioxidant. Excess water is removed from vegetables with the centrifuge before packaging. Shredding and dicing is accomplished with the Qualheim vegetable cutter when the workload necessitates.



### SECTION III

#### OBSERVATIONS AND FINDINGS

1. The surveys conducted on the thirty-one items listed at Incl 1 were divided into the categories of vegetables, salads, potatoes, and meats. These four categories were used in making a labor comparison between the Ingredient Preparation Activity (IPA) and Dining Facilities (DF) (Incl 2). The operations of shredding and dicing for carrots, celery, and green peppers and the operations of shredding, dicing, and slicing for potatoes were combined to achieve more surveys for comparison. The data is listed in man-minutes per 100 servings. The computation of 100 servings is based on the following issue factors:

<u>Product</u>	<u>Weight Per 100 Servings</u>
Potatoes	35.00 Pounds
Cabbage	12.00 Pounds
Green Peppers	5.33 Pounds
Carrots	6.50 Pounds
Celery	6.75 Pounds
Lettuce	4.00 Pounds
Onions	8.00 Pounds
Cheese, Diced	4.00 Pounds
Ham, Diced	4.00 Pounds
Ham, Sliced	18.75 Pounds
Bologna, Sliced	12.50 Pounds
Tartar Sauce	85 Servings Per Pan
Seafood Cocktail Sauce	75 Servings Per Pan
Gelatin Salads	25 Servings Per Pan
Three Bean Salad	25 Servings Per Pan
Meatballs	59.00 Pounds
Meat Loaf	47.00 Pounds
Salisbury Steak	41.00 Pounds

2. Each survey was averaged for individual comparison, category comparison, and overall comparison for labor between IPA and DF. The overall average is the labor comparison of all surveys for IPA (137) and all surveys from DF (84) with the exception that seafood cocktail and tartar sauces are not included. The data shows a major labor savings for products prepared in the IPA. For example, the IPA achieved an average 13.76 man-minutes per 100 servings for potatoes



AD-A078 943

ARMY TROOP SUPPORT AGENCY FORT LEE VA DIRECTORATE OF--ETC F/G 6/8  
INGREDIENT PREPARATION ACTIVITY.(U)

UNCLASSIFIED

SEP 79  
CS-SD-7903

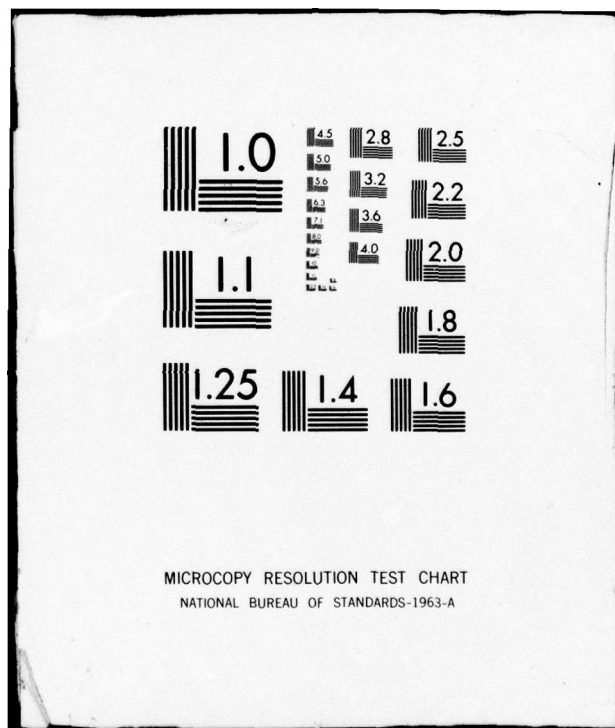
NL

2 OF 3

AD-A078943









(whole, diced, shredded, sliced) versus 38.03 man-minutes per 100 servings for DF. In another instance the IPA achieved an average of 9.18 man-minutes per 100 servings for celery (shredded, diced) versus 44.00 man-minutes per 100 servings for DF. The largest labor savings, 31.04 man-minutes decrease per 100 servings, occurred in the meat category and the smallest labor savings, 13.04 man-minutes decrease per 100 servings, occurred in the salad category. The overall average shows a 23.30 man-minute decrease in IPA per 100 servings.

3. To better understand the significant labor savings indicated by Incl 2, it was necessary to compare the data collected to a known production. The total production for the Fort Lee Ingredient Preparation Activity for six months was determined and from it an average weekly production was established. Using this projected production, potential labor savings were compared based on data shown at Incl 2. The data listed at Incl 3 shows a potential weekly savings of 174.57 hours in dining facilities or a man-week savings of 5.46 (80% production). This indicates that Fort Lee dining facilities require from five to six man-weeks/man-years extra to do the same workload handled by the Ingredient Preparation. The above computation of manpower savings is based on eighty percent productive time, which is actually higher than that observed in DF during the CFPS evaluation. It should be noted that this saving of man years is strictly theoretical, since much of the time saved is time spent by several persons, often at the same time in the same facility.

4. The labor savings from Ingredient Preparation can be observed more dramatically by looking at the six graphs listed at Incl 4. The graphs are a simple comparison of the man-minutes per 100 servings between Ingredient Preparation and dining facilities. The charts all show a labor savings in IPA with the highest savings for meat loaf and the least for lettuce salad.



5. Besides savings in labor, the Ingredient Preparation facility was able to achieve a higher overall product yield as listed at Incl 5. For instance, the IPA achieved an average yield of 84.43% for potatoes (diced, shredded, sliced) versus 65.23% for DF and 77.77% yield suggested in the TM 10-412 recipes. In a second instance, the IPA achieved an average yield of 91.61% for cabbage (chopped) versus 72.00% for DF and 79.00% yield suggested in the TM 10-412 recipes. The higher yields were achieved by using high speed, more efficient equipment such as the lye potato peeler, Urschel slicer/dicer, and meat moulding machine. The reason for the lower yield in IPA versus in DF for meatballs was attributed to the excess loss during forming by the meat moulding machine and meatball rounding machine. For meatballs, the meat moulding machine and rounding machine were inefficient, causing meat to fall on the floor and to be wasted in the operating parts of the machine. Therefore, the IPA discontinued use of the rounding machine because of the waste, and meatballs were sent to the DF unrounded. In the case of bacon, the 3.83% loss was due to ends and pieces left during slicing slabs of bacon. These bacon pieces were not wasted, however, as they were bagged and sent to DF to be used in vegetables and soups.

6. The labor savings disclosed at Incls 2, 3, and 4 for IPA are related directly to the labor costs as outlined at Incl 6. The labor cost per hour between IPA and DF is not significantly different, indicating that the same skill level personnel work on similar items at both places. However, there is potentially a significant difference in labor cost per pound. For instance, the IPA had a labor cost of \$.10489 for whole potatoes compared to a cost of \$.24850 in DF. In a second instance, the IPA had a labor cost of \$.12173 for sliced, paned bacon compared to a cost of \$.69080 in DF. However, it is difficult to make a fair cost comparison because of the lack of sufficient data for dining facilities.



It is expected that the large reduction in labor in the IPA compared to DF would show up as lower product cost per pound for IPA.

7. The total cost savings for IPA can be seen in a better perspective if costs for labor, food, and packaging are combined. Using a sample of some actual observations in IPA and DF, costs shown at Incl 7 show generally lower costs per 100 servings for IPA products over those prepared in DF's. For instance, the IPA had a labor cost of \$2.30 per 100 servings for cabbage (shredded, chopped) compared to an average cost of \$3.77 per 100 servings in DF. In a second instance, the IPA had a labor cost of \$4.07 per 100 servings for whole potatoes compared to a cost of \$6.92 per 100 servings for DF. The costs for some meat items are closer, however. Meat loaf costs are about the same between IPA and DF, primarily due to similar handling procedures. All labor is performed manually in both IPA and DF except for the mixing step in the IPA which is done by a mechanical mixer. Cost for meatballs varied considerably, but generally they were more costly to prepare in the IPA, due to added cost for packaging, more waste in IPA, and the time involved in running meatballs through two machines and then having to manually finish rounding and place them in pans.



#### SECTION IV

#### CONCLUSIONS

Based on the data collected in the IPA and DF's on operational procedures, time involved with each product, yields, and costs, the following were concluded:

- a. Significant manhours are saved for products prepared in the IPA over DF.
- b. Higher product yields are achieved in IPA compared to DF.
- c. Lower costs per serving for food, labor, and packaging result with items prepared in IPA over DF.
- d. Hypothetical savings of personnel can be computed, but data is not precise enough to determine actual DF manpower/manyear savings.



ITEMS SURVEYED IN IPA AND DF's

POTATOES

Diced  
Shredded  
Sliced  
Whole

VEGETABLES

Chopped Cabbage  
Shredded Cabbage  
Diced Carrots  
Shredded Carrots  
Diced Celery  
Shredded Celery  
Diced Green Pepper  
Shredded Green Pepper  
Shredded Lettuce  
Dice Onion

MARINATED SALAD

Three Bean

MEATS AND CHEESE

Sliced Bacon	]	
Sliced Bologna	]	Diced/Sliced Items
Diced Cheddar Cheese	]	
Diced Ham	]	
Sliced Ham	]	

Meatballs	]	
Meat Loaf	]	Formed Meats
Salisbury Steak	]	

GELATIN SALADS

Cherry  
Cranberry & Pineapple  
Fruit Cocktail  
Peach  
Pear  
Pineapple & Pear  
Orange & Pineapple  
Strawberry & Pineapple



LABOR COMPARISON BETWEEN IPA & DP

INGREDIENT PREPARATION ACTIVITY

DINING FACILITY

	1	2	3	4	5	6	7	8	9	10	11	12
	MINUTES PER 100 SERVINGS						MINUTES PER 100 SERVINGS					
	AVERAGE						AVERAGE					
<b>VEGETABLES</b>												
Carrots (Sh, Diced)	13.24	15.91	12.68	10.00	9.84	4.37	7.64	8.00				21.67
Celery (Sh, Diced)	9.69	10.65	6.75	5.00	6.75	3.24	7.29	16.06	10.49	16.20		44.00
Peppers, Green (Sh, Diced)	8.09	7.37	5.37	6.40	10.62	5.31	1.43	12.57	9.80	2.57		28.95
Onions (Diced)	13.92	18.02	11.47	10.40	7.70	6.65						47.67
Cabbage (Chopped)	7.59	7.46	8.22	10.88	4.45	4.57						35.75
AVERAGE							9.30					36.20
<b>SALADS</b>												
Cabbage (Shredded)	5.57	5.36	4.46	12.07	9.87							24.75
Lettuce (Shredded)	3.72	4.53	5.65	3.52	3.34	2.51	2.76					8.60
Gelatin Salads	10.38	10.21	5.70	7.60	15.47	15.00	11.22	8.85	6.58	9.52		17.77
Gelatin Salads	3.56	11.67	7.32	10.62	5.38	6.58	5.56	19.58	10.91	9.70		
Gelatin Salads	7.65	6.67	6.76									
Three Bean Salad	27.14	18.00	29.33	23.10								22.33
Seafood Cocktail Sauce*	10.00	12.32	7.24	12.95	7.04	14.08	5.87	7.92	9.64			31.75
Tartar Sauce*	9.77	7.53	8.93	4.01	8.22	8.61	10.04					
*NOT INCLUDED IN AVERAGE												
AVERAGE							12.27					27.54
<b>POTATOES</b>												
Whole (Peeled)	14.13	6.78	13.77	11.64	11.09	10.27	9.95	6.70				27.07
Diced, Shredded, Sliced	15.98	17.29	14.46	14.32	16.50	15.58	15.92	16.49	16.15	15.80		45.34
AVERAGE												36.20
<b>MEATS</b>												
Salisbury Steak	24.64	26.67	24.22	58.92								84.47
Meatballs	34.30	50.91	50.00	84.00								58.20
Meat Loaf	33.95	34.75	55.00	45.58								71.25
AVERAGE												20.50
Sliced Bacon	14.36	17.50	16.28	14.47	13.45							19.50
Diced Ham	1.70	6.41	3.22	2.48	2.68	3.22	2.24	2.68				63.33
Sliced Ham	28.75	18.01	16.43	12.27								11.62
Sliced Logna	8.33	6.53	9.44	8.50								
ALL AVERAGE							16.68					



ONE WEEK DATA FROM INGREDIENT PREPARATION

NOTE: + Figuring on 80% efficiency  
(32 hours per week)

Conclusions = 174.57 + 32 = 5.46

Potential Man Week Savings

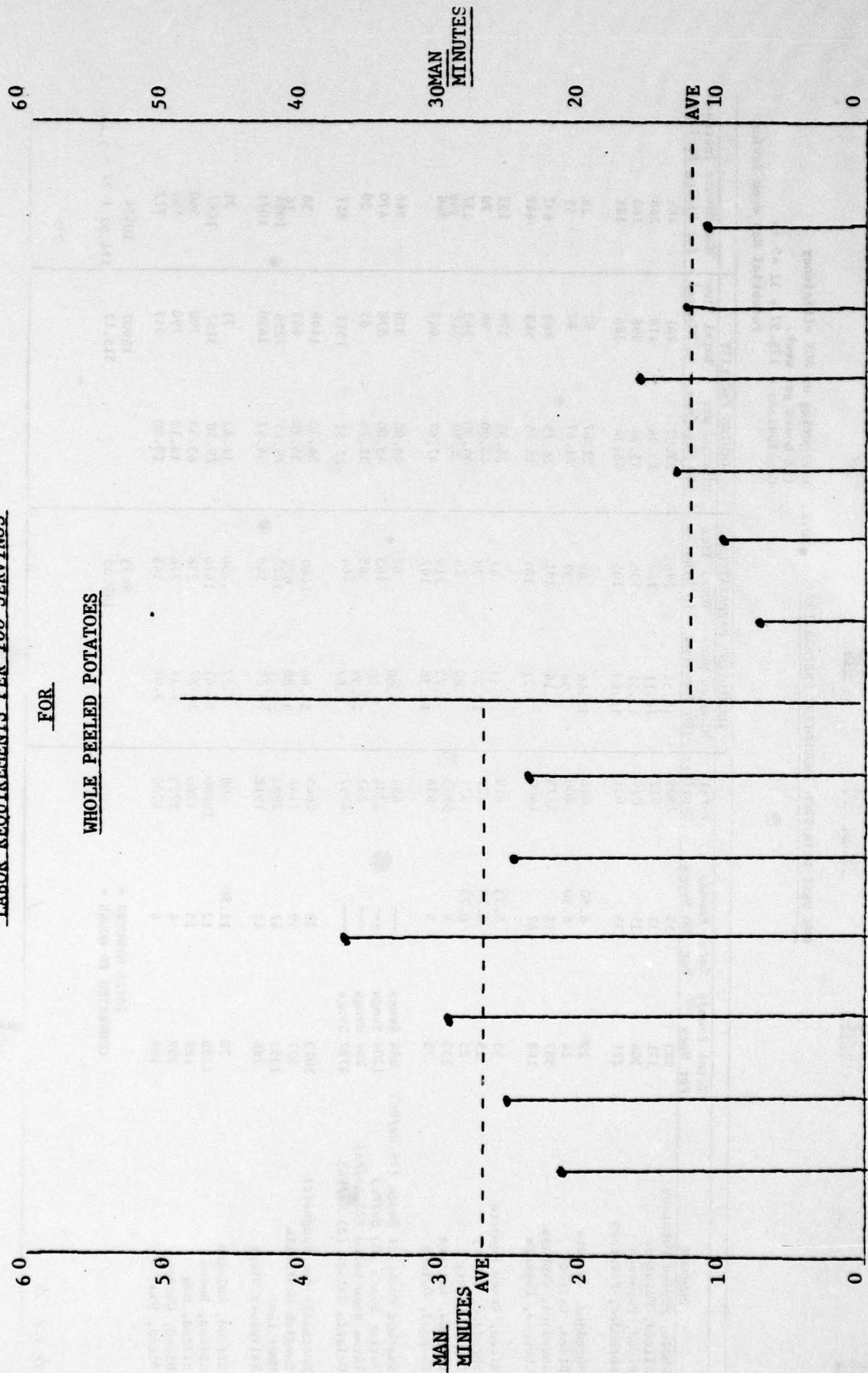
PRODUCT	Total Pounds		Total Servings		INGREDIENT PREPARATION		DINING FACILITY		Man Minute Increase for Dining Facility
	Per Week	Per 100 Svngs	Per Week	Per 100 Svngs	Minutes per 100 Servings	Total Time in Minutes	Minutes per 100 Servings	Total Time in Minutes	
Whole, Peeled Potatoes	983	35	2809		10.54	296	27.07	761	465
Sliced, Potatoes	321	35	917		16.11	148	45.34	416	268
Diced, Potatoes	306	35	874		15.51	136	45.34	396	260
Shredded, Potatoes	221	35	631		16.63	105	45.34	286	181
Shredded, Carrots	29	6.50	446		15.46	69	21.67	97	28
Diced, Carrots	26	6.50	400		7.96	32	21.67	87	55
Shredded, Cabbage	387	12	3225		7.14	231	26.75	863	632
Chopped, Cabbage	168	12	1400		7.21	101	38.75	543	442
Diced, Green Peppers	33	5.33	619		7.53	47	28.95	179	132
Shredded, Celery	15	6.75	222		12.70	28	44.00	98	70
Diced, Celery	25	6.75	371		7.80	26	44.00	163	137
Chopped, Lettuce	235	4	5875		3.73	219	8.80	517	298
Chopped, Onions	75	8	938		11.36	107	47.67	447	340
Seafood Cocktail Sauce (75 Sv/Pn)	684 Svngs	---	684		9.00	62	48.00	328	266
Tartar Sauce (83 Sv/Pn)	1204 Svngs	---	1204		9.00	108	48.00	578	470
Three Bean Salad (25 Sv/Pn)	267 Svngs	---	267		24.39	65	31.75	85	20
Gelatin Salads (25 Sv/Pn)	4797 Svngs	---	4797		9.67	464	27.33	1311	847
Meatballs for Spaghett	1013	38	2665		54.80	1460	56.20	1498	38
Swedish Meatballs	677	59	1148		54.80	629	56.20	645	1034
Meat Loaf	1355	47	2883		43.32	549	78.25	2256	1071
Salisbury Steak	786	41	1918		8.22	50	84.47	1620	1071
Sliced, Bologna	76	12.50	608		15.61	1670	11.62	71	21
Sliced, Bacon	1288	12	10700		18.87	238	29.50	3157	1487
Sliced, Ham	189	15	1260		4.31	226	63.33	798	560
Diced, Cheese	209	4	5225		3.08	145	15.12	790	564
Diced, Ham	188	4	4700				19.50	917	772
TOTAL MINUTES =					8433	18907			
CONVERTED TO HOURS =					140.55	315.12			
							174.57 + 32 = 5.46		



# LABOR REQUIREMENTS PER 100 SERVINGS

FOR

WHOLE PEELED POTATOES



C-14

DINING FACILITIES

INGREDIENT PREPARATION

OB. TIONS

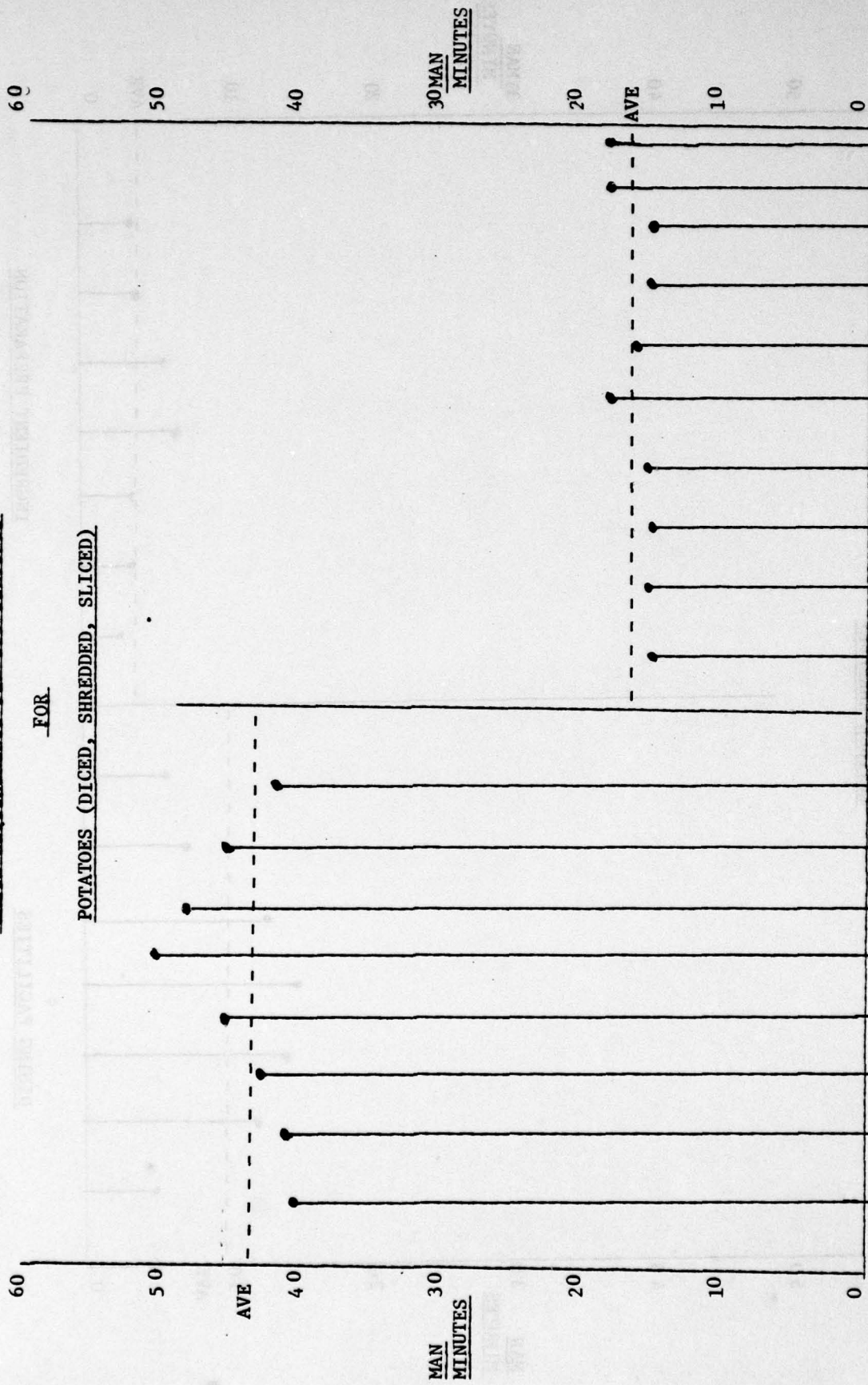
INCL



LABOR REQUIREMENTS PER 100 SERVINGS

FOR

POTATOES (DICED, SHREDDED, SLICED)



DINING FACILITIES

INGREDIENT PREPARATION

OBSERVATIONS

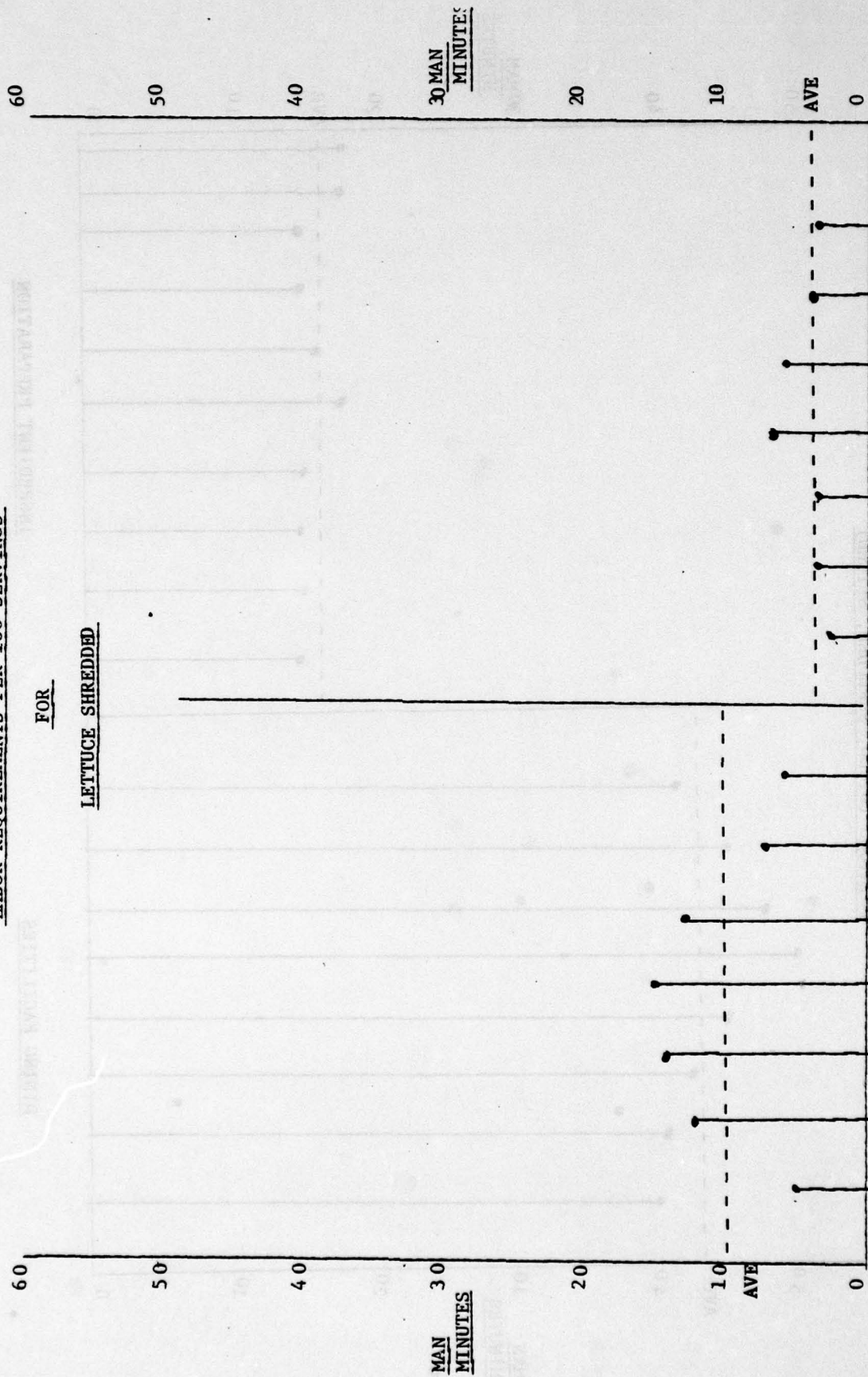
TABLE 4



LABOR REQUIREMENTS PER 100 SERVINGS

FOR

LETTUCE SHREDDED



DINING FACILITIES

INGREDIENT PREPARATION

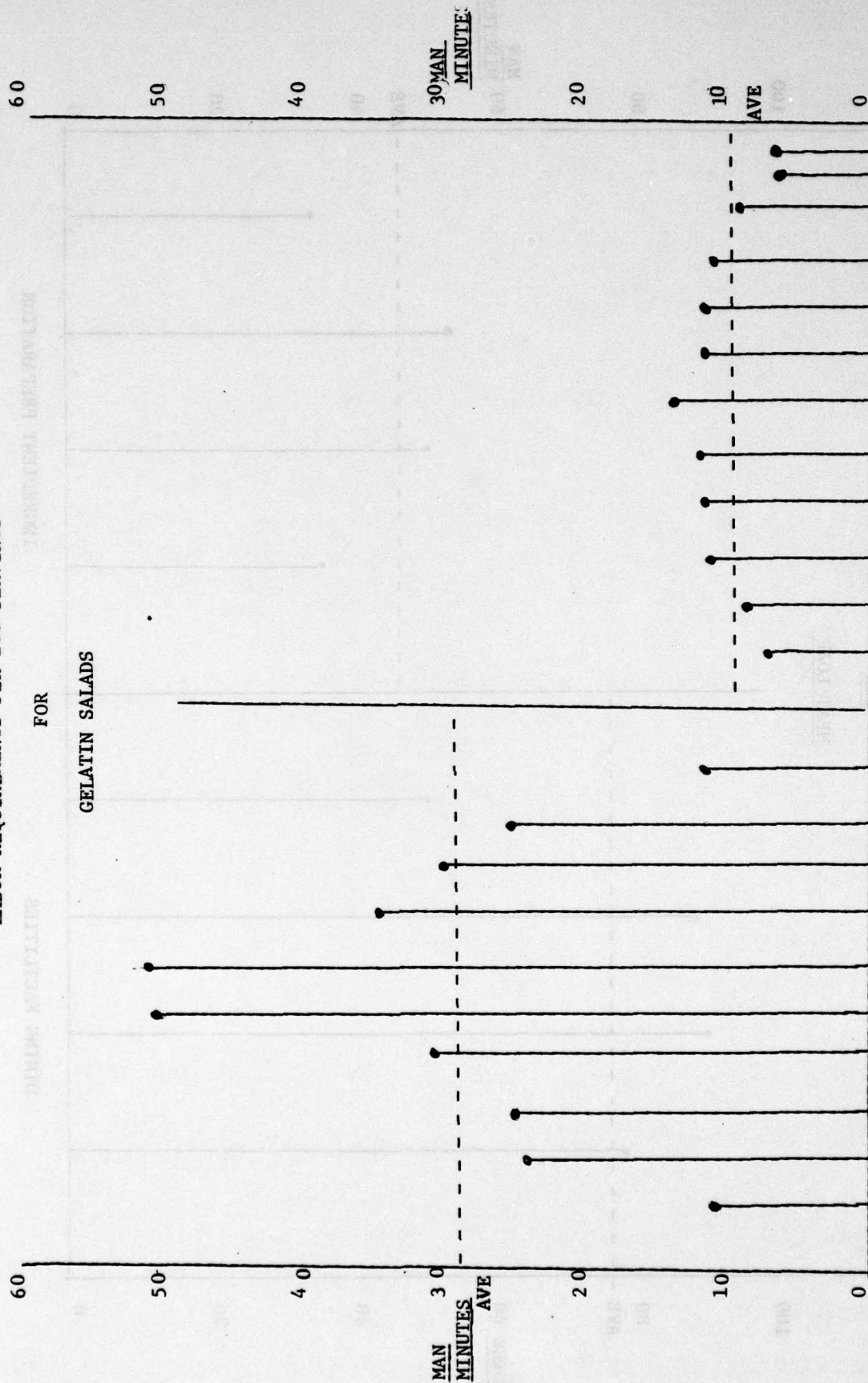
OBSERVATIONS



# LABOR REQUIREMENTS PER 100 SERVINGS

FOR

GELATIN SALADS



C-17

DINING FACILITIES

INGREDIENT PREPARATION

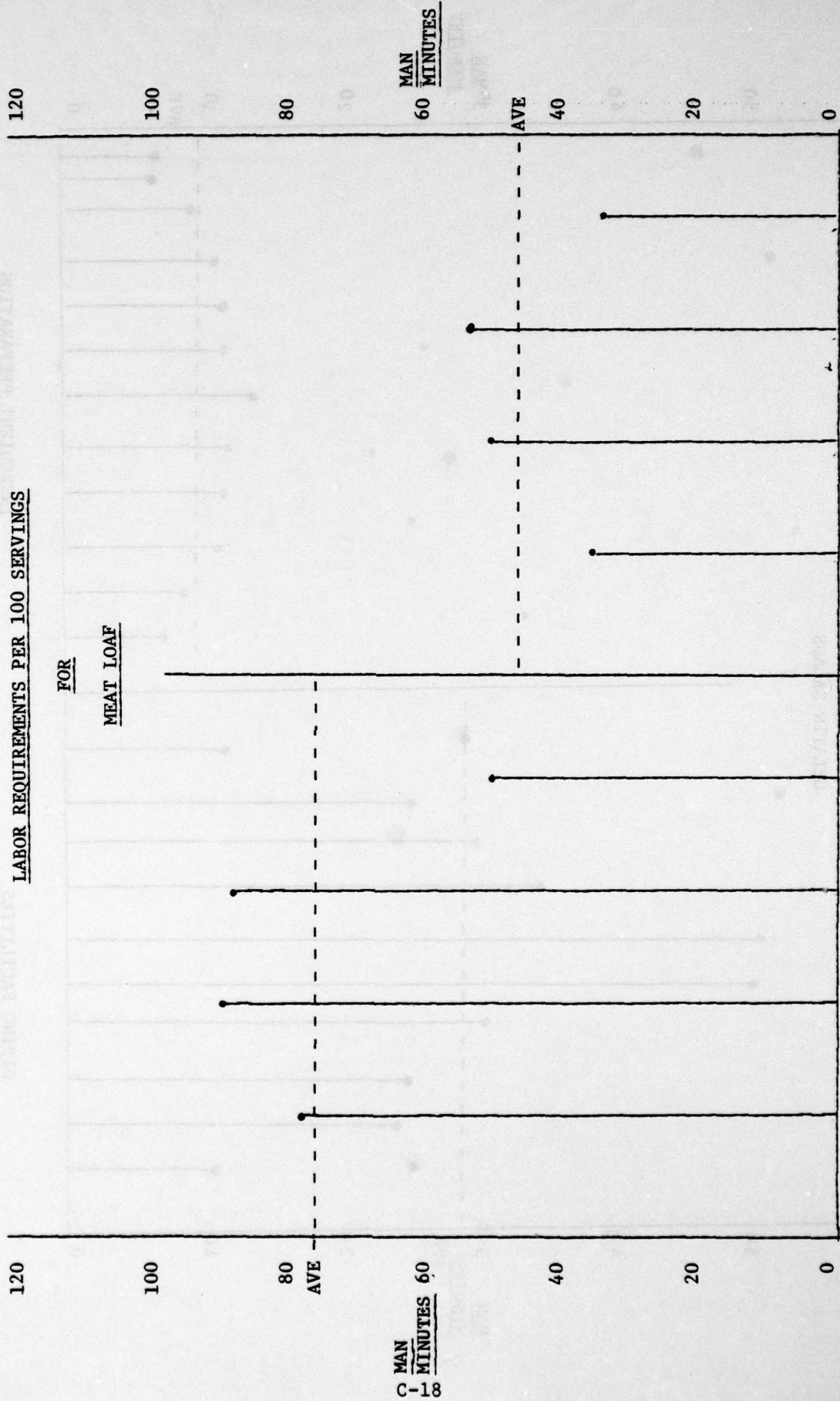
OBSERVATIONS

Incl 4



# LABOR REQUIREMENTS PER 100 SERVINGS

FOR  
MEAT LOAF



INGREDIENT PREPARATION

DINING FACILITIES

OB ATIONS

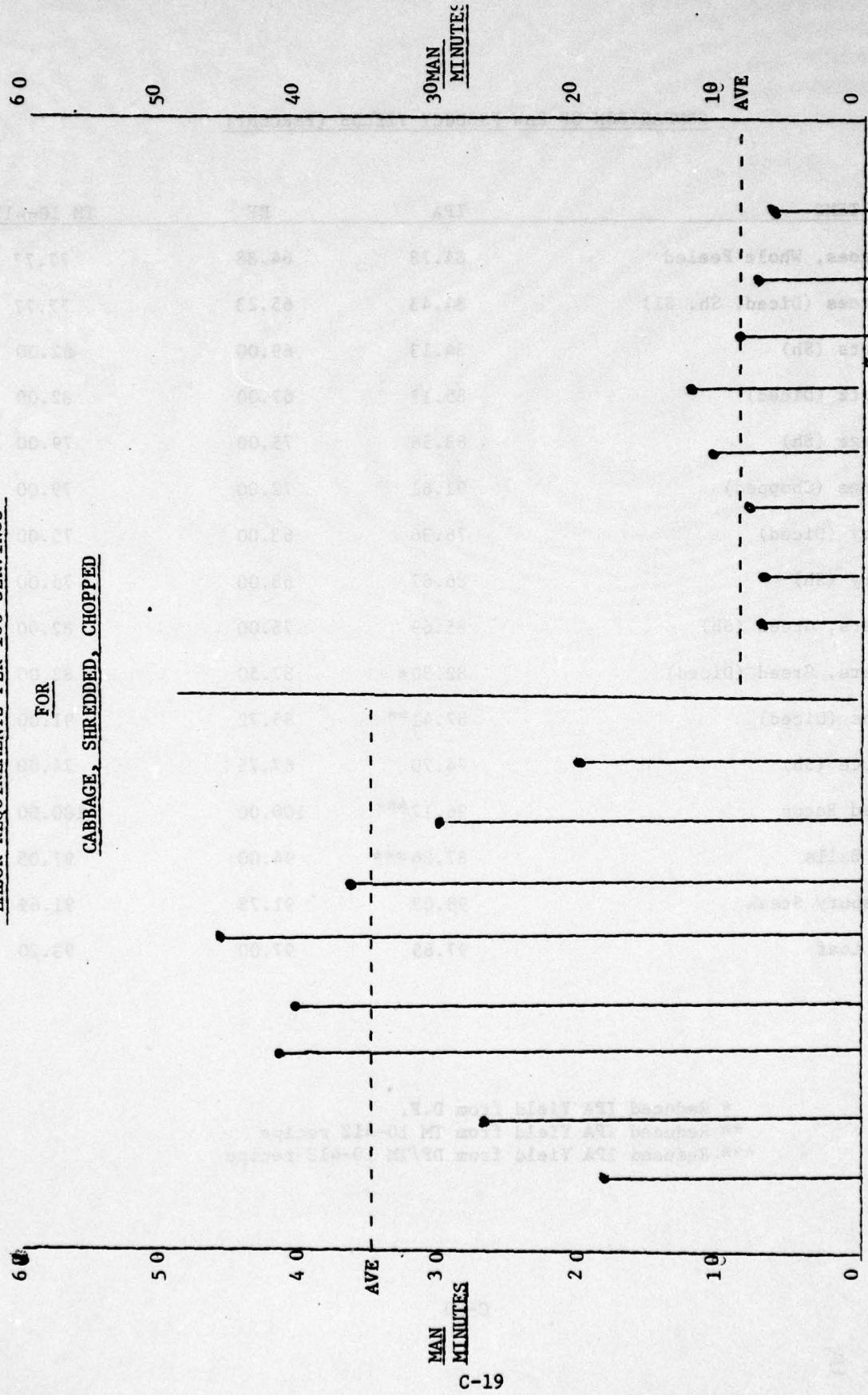
14



LABOR REQUIREMENTS PER 100 SERVINGS

FOR

CABBAGE, SHREDDED, CHOPPED



C-19

DINING FACILITIES

INGREDIENT PREPARATION

OBSERVATIONS

I No L 4



COMPARISON OF RAW PRODUCT YIELDS (PERCENT)

ITEMS	IPA	DF	TM 10-412
Potatoes, Whole Peeled	84.78	64.88	77.77
Potatoes (Diced, Sh, S1)	84.43	65.23	77.77
Carrots (Sh)	84.13	69.00	82.00
Carrots (Diced)	85.17	67.00	82.00
Cabbage (Sh)	83.56	75.00	79.00
Cabbage (Chopped)	91.61	72.00	79.00
Celery (Diced)	76.36	63.00	75.00
Celery (Sh)	86.67	68.00	75.00
Peppers, Green (Sh)	85.69	75.00	82.00
Peppers, Greed (Diced)	82.30*	87.50	82.00
Onions (Diced)	87.41**	85.72	91.00
Lettuce (Sh)	74.70	67.75	74.00
Sliced Bacon	96.17***	100.00	100.00
Meat Balls	87.86 ***	94.00	97.05
Salisbury Steak	98.02	91.78	91.69
Meat Loaf	97.65	97.00	93.20

\* Reduced IPA Yield from D.F.

\*\* Reduced IPA Yield from TM 10-412 recipe

\*\*\* Reduced IPA Yield from DF/TM 10-412 recipe



LABOR COSTS

PRODUCT	IPA		LABOR COSTS			
	LABOR COST PER HOUR	LABOR COST PER POUND	LABOR COST PER SERVING	LABOR COST PER HOUR	LABOR COST PER POUND	LABOR COST PER SERVING
Potatoes, Whole, Peeled	\$ 6.29	\$0.10489	---	5.03	.2485	
Potatoes, Diced	5.89	0.03518	---	6.74	.0772	
Potatoes, Sliced	8.12	0.01987	---			
Potatoes, Shredded	5.09	0.05614	---			
Cabbage, Chopped	5.39	0.05975	---			
Cabbage, Shredded	5.37	0.07654	---	6.33	0.869	
Carrots, Diced	5.38	0.08099	---			
Carrots, Shredded	5.52	0.16515	---	6.74	.223	
Celery, Diced	5.65	0.00912	---			
Celery, Shredded	5.58	0.15822	---	4.66	.0215	
Green Pepper, Diced	5.07	0.10661	---	4.50	.0022	
Green Pepper, Shredded	5.66	0.20598	---	5.38	.0037	
Lettuce, Chopped	6.48	0.11465	---	5.18	.1158	
Onion, Diced	5.46	0.18667	---	5.38	.0033	
Jello Salads	5.06		.07484	5.80		.7931
Meatballs	5.48	0.13469	---	5.96	.1124	
Meat Loaf	5.42	0.07248	---	6.69	.0576	
Salisbury Steak	5.55	.07432	---	7.65	.0824	
Bacon, Sliced (panning only)	5.47	0.12173	---	4.14		.6908
Bologna, Sliced	5.33	0.05357	---			
Cheese, Diced	6.11	.07392	---			
Ham, Diced	5.03	.06244	---			
Ham, Sliced	5.27	.09522	---			

Inc. 6

Inc. 6



COST COMPARISON - IPA vs DF

ITEM	INGREDIENT PREPARATION ACTIVITY			DINING FACILITY			SERVINGS	COST			FOOD	LABOR	TOTAL	100 SERVINGS	TOTAL	100 SERVINGS
	SERVINGS	LABOR	FOOD	PACKAGING	TOTAL	100 SERVINGS		LABOR	FOOD	TOTAL						
CABBAGE (Shredded/Chopped)	1042	562	1500	150	2212	4.12	50	225	160	485	476	485	100	485	476	
	541	435	780	46	1331	3.97	100	403	152	555	552	555	100	555	552	
	1167	464	1680	168	2312	2.97	100	171	150	321	321	321	100	321	321	
	1133	843	1632	162	2617	2.33	100	112	150	262	262	262	100	262	262	
	1408	877	1240	174	2271	2.31	100	112	150	262	262	262	100	262	262	
POTATOES (Whole, Peeled)	2125	1910	3060	246	5416	2.45	100	445	432	877	877	877	100	877	877	
	1375	1557	1980	198	3537	2.57	100	357	257	614	614	614	100	614	614	
	2271	2142	2360	252	5085	2.24	80	189	350	539	539	539	80	539	539	
	3714	4661	10400	416	15477	2.17	83	180	350	530	530	530	83	530	530	
	3631	4426	10168	408	15002	2.13	89	209	350	559	559	559	89	559	559	
JELLO SALADS: Fruit Cocktail	3471	5302	5720	392	15814	2.44	94	510	380	890	890	890	94	890	890	
	3214	4284	9000	360	13614	2.25	103	421	364	785	785	785	103	785	785	
	2543	2436	7120	288	9987	3.87	176	260	700	960	960	960	176	960	960	
	2643	1648	7800	296	9341	3.54	100	327	378	705	705	705	100	705	705	
	775	466	3348	908	4722	6.09	100	471	339	810	810	810	100	810	810	
MEAT LOAF	550	344	2393	645	3332	6.04	100	327	378	705	705	705	100	705	705	
	820	733	3136	1201	5470	6.18	100	171	304	475	475	475	100	475	475	
	1040	706	4116	524	6342	6.10	70	283	428	711	711	711	70	711	711	
	800	4023	37840	2244	44207	55.25	100	271	4326	4597	4597	4597	100	4597	4597	
	3090	8216	118965	9454	137235	44.41	150	1180	6404	7580	7580	7580	150	7580	7580	
SALISBURY STEAK	1920	4442	73120	5126	83988	43.74	100	924	4326	5250	5250	5250	100	5250	5250	
	1950	4239	75075	5719	85808	43.60	173	1466	6718	8184	8184	8184	173	8184	8184	
	933	3929	37320	1553	42592	45.92	184	582	6873	7455	7455	7455	184	7455	7455	
	2289	7344	107503	9587	124808	54.92	100	924	4326	5250	5250	5250	100	5250	5250	
	195	1020	10374	459	11853	60.78	100	1466	6718	8184	8184	8184	100	8184	8184	
MEATBALLS	960	4765	23807	1878	30448	31.72	184	582	6873	7455	7455	7455	184	7455	7455	

C-22



ANNEX D  
EQUIPMENT USAGE



## ANNEX D

### EQUIPMENT USAGE

1. Personnel from NARADCOM observed equipment use in the Central Food Preparation Facility (both Central Kitchen and Ingredient Preparation Activity) at Fort Lee during June 1978 and late August 1978. The listing of IPA equipment observed is at incl 1 and comments on usage during June are at incl 2. They concluded that:

a. The equipment in both facilities was underutilized. Though they concentrated on central kitchen equipment utilization, their observations applied also to IPA. They stated that with a given number of people assigned to the activity, the high production capability of equipment reduced operational time and allowed the personnel to perform other required duties or tasks during the course of the work shift. For examples the team cited:

(1) Potato Peeling Machine - Operated only once during the week for one and one-half hours, the machine peeled 2,000 pounds of potatoes for use in various recipes in the dining facilities. This amount served the number of troops attending the QM school for one week (the troop strength was very low at that particular time).

(2) Meat Moulding Machine - This machine is capable of making 60 patties per minute. If fully utilized in terms of running time it could produce about 20,000 patties per day, allowing two hours for preparation and cleaning. Due to the existing troop strength, however, it was actually used an average of one hour per day to make about 1,500 patties.

b. Some of the advantages to be gained from using high production equipment are offset somewhat by the amount of time spent in preparation, conveying food products, weighing and panning, bagging or placing in other containers, chilling food, unloading frozen food, and cleaning equipment. With the low rate of consumption (headcount) observed, the team stated that it would not pay to automate such functions, which at the same time would probably tend to reduce the reliability of the entire system.

c. The equipment in the IPA is capable of producing far greater quantities of food products than the output required to feed troops at Fort Lee. If necessary, production could be increased up to a greater level of support with the equipment on hand without any additional people. However, there would be a point where more people would be required, or some functions such as conveying, weighing, loading, unloading and packaging would have to be automated, as previously stated, to increase production beyond that point.



2. Based on TSA request, NARADCOM reviewed the Fort Lee IPA operations and developed a listing of proposed production equipment for four different size IPA's. This equipment list is at Incl 3. The economic analysis conducted by the University of Massachusetts used the original Fort Lee IPA equipment list, with costs updated for inflation. A comparison of costs was made with the aforementioned NARADCOM proposed equipment list. This analysis is at Incl 4. The annual capital recovery cost for the Fort Lee IPA as used in the economic analysis was \$15,489, while the more recent NARADCOM proposed equipment list ranged from \$10,744.85 to \$11,550.46. Because of this slight difference in annual cost, the original economic analysis was not changed.



# INGREDIENT PREPARATION FACILITY

ITEM #	NIPR #	ITEM DESCRIPTION	MANUFACTURER	MODEL	URGENCY OF REPAIR PRIORITY
2	12	Scale, Dial & Beam Indicating	Hobart	402 w/Chart Des 912	
3	1	Food Washer	Green Div/Dover Corp	GA(D) Tilting Type	2
4	10	Lye Make-Up Tank	A. K. Robbins	T-7	1
5	9	Lye Conveyor, Elevator Type	A. K. Robbins	Model 2000-S	1
5	15	Conveyor, Horizontal, Belt Type	A. K. Robbins	3900-NS1	1
6	109	Ice Machine	Queen	Scottaman Cuber SC1000W/11AS	2
8	3	Centrifuge, Crispin	Bock	FP50	2
11	88	Vertical Cutting Mixer	Hobart	VCM-40	2
12	82	Vegetable Cutting & Slicing Machine w/Alt	Hallide	RG-1	1
13	2	Vegetable Cutter & Slicer	Qualhelm	101	
16	159	Slicer, Meat	U.S. Berkel	170-CS	2
17	103	Molding Machine	Hollymatic	4000A	1
19	79	Can & Bottle Opening & Depositing Center	Qualhelm	DIS-15-ST	4
20	193	Cryovac/Tipper Tie	Cryovac		
14		Vacuum Bagger	Cryovac	G	3
15		Meat Slicer	U.S. Berkel	915	2
18		Meat Mixer	Lasor	250	2



ITEM #	NIPR #	ITEM DESCRIPTION	MANUFACTURER	MODEL	URGENCY OF REPAIR PRIORITY
5		Food Waste Disposer	Waste King	ESD-8	
107		Air Curtain	Universal Jet Industries	B-52	
108		Spray Cleaning Unit	Sage Systems	310	
148		Dolly, Basket	Lincoln	D8V	
161		Electric Water Station	Hobart	HWE-1	
165		Disposer, Food Waste	Waste King	A-15	
175		Compressor, Air	Colt	F-230	
176		Air Curtain	King	2-25	
178		Food Pump, Mobile	Tri-Clover Division Ladish Co		
179		Individual Portioning and Packaging Assembly	FMC Reque Corp	125 "2"	
—		<i>Slicer/Dicer</i>	<i>Unschel</i>		



# INGREDIENT PREPARATION 12-16 Jun 78

DATE	PRODUCT	EQUIPMENT	OPERATORS	TIME	WEIGHT
12 Jun	Cabbage (cole slaw & shredded)	Veg cutter & slicer (Qualheim)	3	2 Hrs	200#
	Carrots (diced)	Veg cutter & slicer (Hallde)	1	5 Min	10#
	Lettuce	Vert cutter/mixer (Hobart)	2	2 Hrs	300#
	Onions	Vert cutter/mixer (Hobart)	1	20 Min	35#
	Vegetables (general)	Centrif. Extractor (Bock)	1	6 Hrs	600#
	Carrots, Celery & Cabbage	Vegetable peeler		1 Hr	55#
	Vegetable (general)	Food washer (Groen)		4 Hrs	1000#

D-5

Inclosure 2 - ANNEX D



# INGREDIENT PREPARATION

DATE	PRODUCT	EQUIPMENT	OPERATORS	TIME	WEIGHT
13 Jun	Vegetables (general)	Centrif. Extractor (Bock)	1	6 Hrs	600
	Vegetables (general)	Food Washer (Groen)		4 Hrs	1000
	Ground beef (meatballs)	Mixer (Butcher Boy)	2	1 Hr	250
	Ground beef (meatballs)	Molding machine (Hollymatic)	5	1 Hr	250
	Potato cake	Mixer (Butcher Boy)		30 Min *10 Min	172
	Potato cake	Kettle (Groen)	2	1 1/2 Hrs *30 Min	172
	Potato cake	Molding machine (Hollymatic)	4	1 Hr *15 Min	172
	Cold cuts	Slicer (U.S. Berkel)	1	2 Hrs	150

\*Actual processing time



# INGREDIENT PREPARATION

DATE	PRODUCT	EQUIPMENT	OPERATORS	TIME	WEIGHT
14 Jun	Cabbage (cole slaw & shredded)	Veg cutter & slicer (Qualheim)	3	2 Hrs	200#
	Carrots (diced)	Veg cutter & slicer (Hallde)	1	5 Min	10#
	Lettuce	Vert cutter/mixer (Hobart)	2	2 Hrs	300#
	Onions	Vert cutter/mixer (Hobart)	1	20 Min	35#
	Vegetables (general)	Centrif. Extractor (Bock)	1	6 Hrs	600#
	Carrots, Celery & Cabbage	Vegetable peeler		1 Hr	55#
	Vegetables (general)	Food washer (Groen)		4 Hrs	1000#
	Ground beef (molding of salisbury steaks)	Molding machine (Hollymatic)	7	1 Hr *25 Min	450#
	Ground beef (mixing of ground beef prior to molding salisbury steaks)	Mixer (Butcher Boy)	2	45 Min *10 Min	450#

\*Actual processing time



# INGREDIENT PREPARATION

DATE	PRODUCT	EQUIPMENT	OPERATORS	TIME	WEIGHT
15 Jun	Vegetables (general)	Centrif. Extractor (Bock)	1	6 Hrs	600#
	Vegetables (general)	Food Washer (Groen)		4 Hrs	1000#
	General potato use (peeling)	Potato peeler (A.K. Robbins)	3	1½ Hrs	2000#
	Meat loaf	Mixer (Butcher Boy)	2	1 Hr	450#
	Potato (slicing/dicing)	Veg cutter & slicer (Hallde)	2	30 Min	100#



INGREDIENT PREPARATION

DATE	PRODUCT	EQUIPMENT	OPERATORS	TIME	WEIGHT
16 Jun	Cabbage (cole slaw & shredded)	Veg cutter & slicer (Qualheim)	3	2 Hrs	200#
	Carrots (diced)	Veg cutter & slicer (Hallde)	1	5 Min	10#
	Lettuce	Vert cutter/mixer (Hobart)	2	2 Hrs	300#
	Onions	Vert cutter/mixer (Hobart)	1	20 Min	35#
	Vegetables (general)	Centrif. Extractor (Bock)	1	6 Hrs	600#
	Carrots, Celery & Cabbage	Vegetable peeler		1 Hr	55#
	Vegetable (general)	Food washer (Groen)		4 Hrs	1000#



DRDNA-WS (22 May 79) 1st Ind  
SUBJECT: Equipment for Ingredient Preparation Activity

US Army Natick Research and Development Command, Natick, MA 01760 28 Jun 79

TO: Commander, US Army Troop Support Agency, ATTN: DALO-TAE-D, Ft. Lee, VA,  
23801

Requested information is inclosed.

FOR THE COMMANDER:

*ASalant*

ABNER S. SALANT  
Director  
Food Engineering Laboratory

2 ~~5~~ Incl  
Added 1 incl  
5. Equip List  
wd incl 1,3,4

Inclosure 3- ANNEX D





DEPARTMENT OF THE ARMY  
U.S. ARMY TROOP SUPPORT AGENCY  
FORT LEE, VIRGINIA 23801

DALO-TAE-D

22 May 1979

SUBJECT: Equipment for Ingredient Preparation Activity

Commander

US Army Natick Research and Development Command

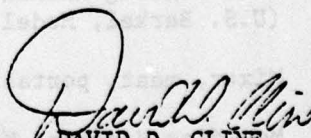
ATTN: DRXNM-WTA

Natick, MA 01760

1. The evaluation of the Ingredient Preparation Activity (IPA) at Fort Lee is nearing completion. As a result of observation of ingredient preparation operations, attached at inclosure 1 is a list of items recommended for production in an IPA type facility. The list of items actually prepared would be contingent on the facility and equipment available and the troop strength of that installation. At inclosure 2 is a listing of equipment currently used in the Fort Lee IPA to produce the items shown in inclosure 1. The actual quantities of IPA items produced at Fort Lee and normal batch size are shown at inclosure 3. At inclosure 4 is data on expected production requirements for Fort Lee and other installations.
2. Request you review the attached and provide your recommendations on currently available equipment required to prepare the items shown at inclosure 2 in the quantities at inclosure 4. Request this list of equipment be identified by make, model, estimated cost and quantity required and be identified separately by size installation (such as 2,000, 4,000, 6,000 and 8,000 rations per day). Receipt of this information by 22 June would be appreciated.
3. Questions pertaining to this action should be addressed to LTC James E. Turner or Mr. Richard Helmer (Autovon - 687-1153/2638).

FOR THE COMMANDER:

4 Incl  
as

  
DAVID D. CLINE  
CPT, AGC  
Adjutant



EQUIPMENT - INGREDIENT PREPARATION ACTIVITY - Fort Lee, VA.

<u>Year Acquired</u>	<u>Item</u>	<u>Description</u>	<u>Qty.</u>	<u>Total Cost</u>
1972	1.	Scales, dial & beam, 10 lb cap. @\$205 ea.	2	\$ 410.00
1972	2.	Food Washer and Waste Disposer	1	1,647.00
1973	3.	Potato Peeler, Conveyor, lye tank (A.K. Robins)	1	9,515.00
1973	4.	Ice Machine, 700 lb. cap. bin	1	1,135.00
1973	5.	Centrifuge, w/auto timer and safety device (Bock Laundry Mach. Co.)	1	1,747.00
1972	6.	Scales, w/table, 75 lb. cap.	1	869.00
1972	7.	Sink @\$1,528.00 ea.	3	4,584.00
1973	8.	Vegetable/Mill Dicer, floor model (Hallde)	1	3,210.00
1978	9.	Vegetable Dicer, floor model (Urchel) (Can be used as meat dicer)		18,000.00
*1974	10.	Vegetable Cutting & Slicing Machine (Qualheim)	1	1,131.00
**1972	11.	Vertical Cutter Mixer (Hobart VCM 25)	1	1,895.00
1976	12.	Steam Kettle, 40 gal. cap.	1	1,108.50
1974	13.	Stainless Steel Tables (2) @\$250.00 (2) @\$663.00, (1) @\$297.00	5	2,123.00
1974	14.	Meat Slicer w/table	1	1,730.00
1972	15.	Meat Slicing Machine floor model (U.S. Berkel, Model 170G5) @ \$2,668.00	2	5,336.00
1976	16.	Mixer, meat, portable w/cover, electric	1	1,506.00
1973	17.	Moulding Machine, Meat & Fish	1	1,430.00
1973	18.	Moulding Machine, Meat & Fish w/conveyor (Hollymatic 4000A)	1	7,471.00
	N/A 19.			
	N/A 20.			
*1973	21.	Filling and Closing Machine	1	3,896.00

INCL 2 to INCL 3

D-12



## EQUIPMENT - INGREDIENT PREPARATION ACTIVITY - Fort Lee, VA. (Cont.)

<u>Year Acquired</u>	<u>Item</u>	<u>Description</u>	<u>Qty.</u>	<u>Total Cost</u>
*1976	22.	Tipper Tie Machine	1	\$ 770.00
	N/A 23.			
	N/A 24.			
1972	25.	Wire Baskets @ \$42.50 ea.	32	1,360.00
**1973	26.	Storage Cabinets @ \$663.00- ea.	3	1,989.00
1977	27.	Pan and Storage Racks @ \$117.25 ea.	6	703.50
	N/A 28.			
	N/A 29.			
1972	30.	Hand Sink	1	1,000.00
1977	31.	Label Printing Machine (Weber)	1	550.00
*1973	32.	Can/Bottle Crusher	1	5,989.00
1977	33.	Can Opener, elec. @ \$82.00 ea.	3	246.00
1977	34.	Vegetable Trimmer	1	360.34
1974	35.	Cleaner, Spray, Auto, Water-Powered Mounted to wall @ \$130.00	3	390.00
1972	36.	Hand Trucks @ \$218.00	3	654.00
***1973	37.	Air Curtains @ \$355.88 ea.	5	1,779.40

NOTE:      \* Eliminate in its' entirety  
              \*\* Change quantity to one (1)  
              \*\*\* Change quantity to two (2)

OFFICE EQUIPMENT:	Desk	\$ 86.00
	Calculator	607.00
	Filing Cabinet	85.00
	Typewriter	441.00
	Water Fountain	199.00



ITEM	EQUIP. NEEDED	MFG.	MODEL	COST	QUANTITY			FT. KNO:
					FT. LEE	FT. CARSON	FT. LEWIS	
					2000	3808	6204	8000
Potato, Whole	Washer	Groen	GA(D)-1	\$10,500	1	1	1	1
Baked	Peeler	Hobart	6460	1,650	1	1	2	2
Diced	Dicer ]	Berkel	RG-2B	2,300	1	1	2	2
Sliced	Shredder ]	Qualheim	101	2,750	1	1	1	1
Shredded	Slicer							
Carrots, Shredded	Washer ]	SAME UNITS AS ABOVE						
Celery, Shredded	Peeler ]	Qualheim	440	1,000	1	1	2	2
Peppers, Shredded	Shredder							
Cabbage, Shredded								
Lettuce, Shredded								
Cabbage, Chopped	Chopper	Berkel	RG-6	5,900	1	1	1	1
Carrots, Dicer	Washer ]	SAME UNITS AS ABOVE						
Peppers, Gr, Dicer	Peeler ]							
Onions, Dicer	Dicer ]							
Celery, Dicer								
Cheese, Cheddar								
Ham, Cheddar								
Bacon, Slab	Slicer	Berkel	180D	6,500	1	1	1	1
Ham	"	"						
Cold Cuts	"							
Sauce, Pizza	Steam	Groen	DL30	1,740	1	1	1	1
BBQ	Kettle							
Meatballs, Swedish	Mixer	Hobart	D300	2,365	1	1	1	1
Spaghett	Moulder	Qualheim	400	1,000	1	1	1	1
Meatloaf	Mixer	Hobart	D600T	4,000	1	1	1	1

39,705 39,705 44,655 44,655



# INGREDIENT PREPARATION

## SUGGESTED EQUIPMENT LIST

<u>ITEM</u>	<u>COST</u>
Scales	\$ 616.49
Food Washer	2,476.48
Centrifuge	2,478.15
Table W/Scale	1,306.65
Sink	6,892.64
Wire Baskets	2,044.94
Storage Racks	790.45
Hand Sink	1,503.63
Label Printing Machine	617.98
Can Opener, Electric	276.41
Cleaner, Spray	521.91
Hand Trucks	927.71
Air Curtains	1,009.65
S.S. Tables	1,774.49
S.S. Tables	669.11
S.S. Tables	397.45
Misc. Office Equipment	<u>2,011.46</u>
Subtotal	\$26,315.60

Subtotal for NARADCOM Projected Ingredient Preparation Equipment Requirements  
by Installation:

	<u>Fort Lee</u>	<u>Fort Carson</u>	<u>Fort Lewis</u>	<u>Fort Knox</u>
	39,705	39,705	44,655	44,655
Totals	<u>\$66,020.60</u>	<u>\$66,020.60</u>	<u>\$70,970.60</u>	<u>\$70,970.60</u>
CRC (10 yrs/10%)	<u>\$10,744.85</u>	<u>\$10,744.85</u>	<u>\$11,550.46</u>	<u>\$11,550.46</u>
CRC, Univ of Mass. Econ Analysis	<u>\$15,489</u>	<u>\$15,489</u>	<u>\$15,489</u>	<u>\$15,489</u>



ANNEX E

INGREDIENT PREPARATION ACTIVITY  
VETERINARY STAFF OFFICE EVALUATION  
USA TROOP SUPPORT AGENCY





DEPARTMENT OF THE ARMY  
U.S. ARMY TROOP SUPPORT AGENCY  
FORT LEE, VIRGINIA 23801

DALO-TAZ-V

5 June 1979

MEMORANDUM FOR CHIEF, SYSTEMS DEVELOPMENT DIVISION, DIRECTORATE OF  
CONCEPTS AND SYSTEMS

SUBJECT: Veterinary Staff Office Evaluation of Ingredient Preparation  
Activity

1. Reference:

a. Memorandum, DALO-TAE-D, 11 Jan 79, subject: Evaluation of  
Ingredient Preparation Activity.

b. DF, DALO-TAZ-V, 26 Jan 79, subject: Evaluation of Ingredient  
Preparation Activity.

2. IAW the above references, the Ingredient Preparation Activity  
operated by the Directorate of Food Management, Ft Lee, was evaluated  
by the Veterinary Staff Office, TSA, to determine the extent of veterinary  
support, laboratory support, and refrigeration considerations required and  
to determine shelf life parameters. This memorandum contains the observa-  
tions, conclusions, and recommendations resulting from the evaluation.

3. Observations:

a. Direct veterinary support during the evaluation was provided by  
the staff of the Technical Support Office, DFM. This support was a  
carry-over from the larger Central Food Preparation Facility project  
and enabled close and nearly continuous veterinary surveillance of the  
IPA operation. The TSO staff provided normal veterinary food inspection  
and sanitation support as well as providing quality control support to  
the IPA staff. The quality control support involved primarily checking  
the accuracy of weights and measures for components. The Installation  
Veterinary Staff, a part of the Ft Lee MEDDAC, provided sufficient  
surveillance to assure that basic public health principles were adhered to  
as well as providing normal veterinary food inspection support to the TISA.  
The IPA at Keesler AFB, MS, was visited. The veterinary support provided  
that activity was much less in scope than that provided the Ft Lee IPA  
by the TSO staff. The Keesler AFB Veterinarian provided support to the  
IPA to the extent of periodic sanitary inspections and food inspections  
upon receipt of the subsistence at the TISA. On 29 Mar 79, the Veterinary



DALO-TAZ-V

5 June 1979

SUBJECT: Veterinary Staff Office Evaluation of Ingredient Preparation Activity

Activity, Ft Lee MEDDAC, and representatives of the DIO, Ft Lee, developed a protocol for continued veterinary support for the IPA. The support outlined in that protocol is limited to normal veterinary food inspection and sanitation surveillance in addition to "after-consumption" microbiological testing by the US Army Medical Laboratory Service. The support is essentially the same as provided the Keesler AFB IPA with the addition of the laboratory analysis. The protocol is attached as Incl 1.

b. Laboratory Analysis. Throughout the Central Food Preparation Facility project, the DFM, Ft Lee, had organic food laboratory support. Several years of laboratory data from the IPA indicate that the foods prepared in IPA are generally "low risk" items and that pre-consumption analysis is not essential. The protocol for veterinary support provides for laboratory analysis to be performed on the IPA items to detect trends and to spot problems in sanitation. The after-consumption testing is based upon the premise that sanitation and separation of different classes of foods will be diligently controlled by the IPA management.

c. Refrigeration Considerations. The IPA will be handling perishable foods. Adequate refrigeration of storage facilities, meat tempering room, preparation areas, and transportation vehicles is essential to prevent spoilage. For the purposes of IPA, the guidance contained in AR40-5 is adequate for storage and for tempering. The preparation room temperature can be a little warmer with 50 - 55° F being adequate.

d. Shelf Life Parameters. Studies were conducted at the IPA during its operation as a part of the Central Food Preparation project to determine the shelf life of IPA items. The protocol for those studies is attached at Incl 2. The comminuted meat products were not studied (meat loaf, salisbury steak, and meatballs). The veterinary support protocol, Incl 1, provides for a shelf life of 36 hours for these high risk items.

#### 4. Conclusions:

a. The attached protocol for veterinary support for IPA provides for adequate coverage. It does not address quality control (weights and measures, adherence to established preparation procedures, etc.) which remains an IPA management function.

b. Laboratory Analysis. After-consumption testing should be adequate based upon past history of the items, the assigned shelf life, and the premise of good sanitation controls.



DALO-TAZ-V

5 June 1979

SUBJECT: Veterinary Staff Office Evaluation of Ingredient Preparation Activity

c. Refrigeration Considerations. AR 40-5 provides for the internal temperature of stored perishable foods in food service facilities to be 45°F and for meat to be tempered in a 40°F atmosphere. Current food service doctrine does not specify preparation room temperature. However, commissary experience indicates that a temperature of 50 F is acceptable for meat (MIL-STD-903A). A temperature of 55°F for produce preparation will adequately deter spoilage.

d. Shelf Life Parameters. The veterinary support protocol for continued IPA operation at Ft Lee provides for three degrees of risk: low, medium, and high. High risk items are limited to consumption within 36 hours; medium risk items are limited to consumption within 96 hours; low risk items are assigned the shelf lives determined by previous studies (Incl 1). The tighter limits on the high and medium risk items are due to the microbiological testing being performed after consumption. The shelf lives provide for the provision of safe, wholesome foods.

5. Recommendations.

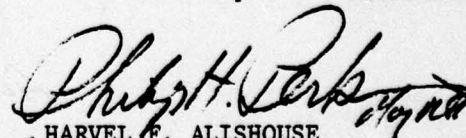
a. That the veterinary support and laboratory support provided for by the attached protocol be adopted for Ingredient Preparation Activities.

b. That laboratory support for Ingredient Preparation Activities be provided by the Army Medical Laboratories as outlined in the protocol for veterinary support.

c. That refrigeration for Ingredient Preparation Activities be designed to conform to the requirements of AR 40-5 and MIL-STD-903A.

d. That the concept of high, medium, and low risk with the shelf lives outlined above be adopted. In the event that shelf lives require redetermination, it is recommended that the shelf life protocol be used.

2 Incl  
as

  
HARVEL F. ALISHOUSE  
MAJ, VC  
Veterinary Staff Officer



DALO-TAZ-V (5 Mar 79)

SUBJECT: Central Food Preparation System (CFPS) Evaluation

TO Dir, DFM  
Ft Lee, VA

FROM Vet Staff Ofc  
TSA

DATE 10 Apr 79 CMT 5  
MAJ Alishouse/chg/1140

OFFICIAL RECORD COPY

1. The support outlined in CMT 4 to be provided by the Veterinary Activity, USA MEDDAC, Ft Lee, to the Quartermaster Center and Ft Lee for the continued operation of the Ingredient Preparation Activity, Bldg 7118, has been reviewed by this office.
2. The support encompasses sanitation and public health considerations. It is the opinion of this office that the support will be adequate to acceptably reduce the risk of food-borne illness.
3. Inclosure 1 provides a listing of Ingredient Preparation Activity end items along with an assessment of each item as to its degree of risk. This office concurs with both the risk assessment and the consumption times shown for the various levels of risk.

1 Incl  
nc

RICHARD D. FARRIS  
COL, VC  
Chief

CF:  
Dir of Health Svcs  
ATTN: ATZM-MD-XO

MFR/MAJ Alishouse/chg/1140/10 Apr 79

The support outlined in comment 4 was developed in a meeting with DFM personnel and CPT Lipscomb, Ft Lee MEDDAC. The Vet support was limited to assure sanitation and public health. Quality Control, as it has become to be known for CFPP, will remain the exclusive purview of the DIO, Ft Lee. The Ft Lee MEDDAC will not get involved in recipe formulation, ingredient measuring, etc., unless there is an unforeseen impact on sanitation.



ATZM-MD-V (5 Mar 79)

SUBJECT: Central Food Preparation System (CFPS) Evaluation

THRU: Staff Vet Ofcr, TSA  
ATTN: MAJ Alishouse

FROM: Dir of Health Svcs  
ATTN: ATZM-MD-XO

DATE: 29 Mar 79 CMT 4  
CPT Lipscomb/bw/2842

TO: DFM, BLDG T-7124

1. Reference paragraph 4, CMT 3. The Veterinary Activity, USAMEDDAC, Fort Lee, can provide laboratory support for all tests required by the Post Veterinarian for the Ingredient Preparation Facility through the food laboratory at Fort Meade, Maryland, and utilizing equipment from the DFM Laboratory for local evaluation. This support is contingent on the following:

a. Meat items and other "high-risk" items, as determined by the Deputy for Veterinary Activities, are consumed within 36 hours of preparation.

b. "Low-risk" items may have shelf life as currently determined by DFM.

c. Only those items as listed at Inclosure 1 are prepared by this Facility. New items must have the concurrence of the Deputy for Veterinary Activities prior to preparation.

d. Items which cannot be produced in a sanitary manner at this Facility, as determined by results of laboratory tests, are discontinued until adequate sanitary standards and controls, as set forth by the Deputy for Veterinary Activities, are met.

2. The support which can be provided by the MEDDAC consists of:

a. In-process inspection by Veterinary personnel during routine processing.

b. Monthly sanitary inspections by a Veterinary Officer.

c. Routine testing for specific pathogens, coliforms, and total bacterial counts for after-consumption evaluation of all food items utilizing the food laboratory at Fort Meade, Maryland.

d. Routine testing of food contact surfaces for proper sanitation using CONTACT-IT tape and/or Milipore techniques utilizing equipment available at the DFM Laboratory and the Veterinary Activity.



ATZM-MD-V

29 March 1979

SUBJECT: Central Food Preparation System (CFPS) Evaluation

e. Routine sanitary inspections of dining facilities by Preventive Medicine personnel.

3. Should further support be required by this Facility it would have to be arranged by mutual consent of the DIO, Director of Health Services, and the Deputy for Veterinary Activities.

4. Provided the above support and restrictions are accepted by DFM and DIO the MEDDAC can utilize the laboratory BLDG T-11110 and all equipment contained therein. This equipment would be utilized by the Veterinary Activity, Preventive Medicine Activity, and Department of Pathology in support of their missions.

FOR THE COMMANDER:

1 Incl  
as

WILLIAM M. BOYD, JR.  
LTC, MSC  
Executive Officer



For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL

SUBJECT

ATZM-FM-CF

Ingredient Preparation Price List  
April 1979

TO  
SEE DISTRIBUTION

FROM  
CFPD  
T-7124

DATE  
21 March 1979  
Mr. McManus/dc/3455

CMT 1

Item	Cost Per Svg	Svg Per Container	Cost Per Container	Unit of Issue
<u>MEAT ITEMS</u> <i>H.g.h Risk - Consumption within 36 hrs.</i>				
Salisbury Steak	\$ .446	10-svg	\$4.46	pan
Meat Loaf	.450	10-svg	4.50	pan
Meatballs	.440	7-svg	3.08	pan
Diced Ham	1.90	5-lb	9.50	bag
Sliced Ham	1.90	5-lb	9.50	pan
Sliced Bologna	.88	5-lb	4.40	pan
Sliced Salami	.95	5-lb	4.75	pan
<u>CHEESE ITEMS</u> <i>Medium risk - Consumption within 96 hr.</i>				
Diced Cheddar	1.40	5-lb	7.00	bag
<u>SHREDDED SALAD INGREDIENTS</u> <i>Low risk - Shelf life as currently established</i>				
Cabbage	.15	5-lb	.75	bag
Lettuce	.36	5-lb	1.80	bag
Carrots	.18	5-lb	.90	bag
Celery	.22	5-lb	1.10	bag
Peppers, Green	.55	5-lb	2.75	bag

DA 2496

REPLACES DD FORM 96, WHICH IS OBSOLETE.

E-7



ATZM-FM-CF

21 March 1979

SUBJECT: Ingredient Preparation Price List - April 1979

<u>Item</u>	<u>Cost Per Svg</u>	<u>Svg Per Container</u>	<u>Cost Per Container</u>	<u>Unit of Issue</u>
<u>CHOPPED SALAD INGREDIENTS</u> - Low risk				
Cabbage	\$ .15	5-lb	\$ .75	bag
<u>DICED SALAD INGREDIENTS</u> - Low risk				
Peppers, Green	.55	5- b	2.75	bag
Carrots	.18	5-lb	.90	bag
Celery	.22	5-lb	1.10	bag
Onions, Dry	.14	5-lb	.70	bag
<u>GELATIN SALADS</u> - Low risk				
Jellied Pear	.065	25-svg	1.63	pan
Peach Jello	.056	25-svg	1.40	pan
Cherry Jello	.016	25-svg	.40	pan
Cranberry & Pineapple	.069	25-svg	1.73	pan
Jellied Fruit Cocktail	.051	25-svg	1.28	pan
Pineapple & Pear	.065	25-svg	1.63	pan
Orange & Pineapple	.070	25-svg	1.75	pan
Strawberry & Pineapple	.077	25-svg	1.93	pan
Melba Mold	.093	25-svg	2.33	pan
<u>MARINATED SALADS</u> Low risk				
Three Bean	.059	25-svg	1.48	pan
<u>SAUCES</u> High risk - consumption within 36 hr.				
Seafood Cocktail	.048	71-svg	3.41	pan
Tartar	.030	83-svg	2.49	pan



ATZM-FM-CF

21 March 1979

SUBJECT: Ingredient Preparation Price List - April 1979

<u>Item</u>	<u>Cost Per Svg</u>	<u>Svg Per Container</u>	<u>Cost Per Container</u>	<u>Unit of Issue</u>
<u>POTATO ITEMS</u>				
Sliced	\$ .08	25-svg	\$2.00	1b
Diced	.08	25-svg	2.00	1b
Peeled	.08	25-svg	2.00	1b
Shredded	.08	25-svg	2.00	1b

NOTE 1: Gelatin Salads will have 25 servings per pan effective 1 April 1979.

NOTE 2: Entree items issued by Troop Issue Subsistence Branch will be priced at March 1979 prices.

NOTE 3: Reference Meatballs - 5 meatballs per serving or 35 meatballs per pan.

*R. L. Robinson*

R. L. ROBINSON

MAJ, QMC

Chief, Central Food Prep Division

DISTRIBUTION:

TISB (2 cys)

DFOD (11 cys)

TSO

Lab

CFPD (3 cys)



ATZM-FM (5 Mar 79)

SUBJECT: Central Food Preparation System (CFPS) Evaluation

TO: Director of Health Services FROM: DFM DATE: 16 Mar 79 Cmt 3  
ATTN: ATZM-MD-XO, P-8130 T-7124 Mr. Patterson/mp/4221

1. Reference paragraph 1, Comment 2. The laboratory equipment and associated supplies within the Laboratory Building T-11110 can be transferred to your activity in its entirety. Your Supply Officer may contact Mr. Malcolm S. Brown, DFM Supply Officer, extension 3470, to effect transfer of equipment and supplies to your activity. The Laboratory Building T-11110 was approved for transfer to your activity during a briefing to the Commanding General on the phasing out of the DFM on 6 March 1979. However, the physical transfer and documentation of the building to your activity will have to be arranged by your activity through the DIO and DFAE.
2. Reference paragraph 2, Comment 2. Information is furnished that at this time the Central Kitchen equipment in Building 6220 has not been reported as excess through appropriate channels, but when it is, it will take considerable time for screening and disposition of the property; therefore, it is unlikely that this building will be available for use by any activity in the near future. The Commanding General has advised the undersigned that the equipment and building must be properly maintained until such time as the equipment is disposed of. After the building is returned to DFAE, the DIO and the Chief of Staff will designate the appropriate use of the building in the future.
3. Reference paragraph 3, Comment 2. Request that you identify the pieces of equipment that the MEDDAC is interested in and provide justification for transfer of the equipment. Based on justification, consideration will be given to the transfer of equipment to meet your requirements.
4. Although this activity concurs in the transfer of the laboratory supplies and equipment and the building to your activity at this time, MEDDAC must provide laboratory support to process samples for the Ingredient Preparation Facility as long as the Ingredient Preparation Facility is operated and laboratory analysis is deemed necessary by the Staff Veterinary Office, Troop Support Agency. This matter can be further discussed with MAJ Allshouse, Staff Veterinary Office, Troop Support Agency, extension 2867.

CARL S. NAPOLI  
LTC, GS  
Director of Food Management

CF:  
DIO LAB & ASO  
DFAE



# PROPOSITION FORM

Use of this form, see AR 340-13, the proponent agency is TAGCEN

REFERENCE OR OFFICE SYMBOL

SUBJECT

ATZM-FM

Central Food Preparation System (CFPS) Evaluation

TO

FROM

DATE

CMT 1

Director of Health Services  
ATTN: LTC Boyd  
Building 8130

DFM  
Building 7124

5 March 1979  
Mr. Rakers/mp/4922

1. Reference letter, DALO-TST, 2 Feb 79, subject as above, with 1st Indorsement, ATLG-TS-TSO, dated 26 February 1979, attached as Intlosure 1.
2. The referenced letter is forwarded for your information and appropriate action by your activity.

1 Incl  
as

*Carl S. Napoli*  
CARL S. NAPOLI  
LTC, GS  
Director of Food Management

M-MD-XO (5 Mar 79)

TO: DFM

FROM: Director of Health Svcs  
ATTN: LTC Napoli  
Fort Lee, VA 23801  
Bldg 7124

DATE: 14 March 1979  
LTC Boyd/ab/3772

CMT 2

1. MEDDAC can utilize, in the interest of Preventive Medicine and patient care, all of the laboratory equipment within Building T-1110 and the building, in its entirety.
2. MEDDAC has been notified by DAFE that the Commanding General has approved the razing of the T-12000 Old hospital annex area (minus ACS), at a substantial cost savings to the Post, if the razing takes place by the winter of CY 1979. Funding is not complete for the proposed MCA new medical warehouse to be constructed on shop road. Sites are being sought for medical activities in the 12000 area. There are 21 medical warehouse and other medical units in the 12000 area. Accordingly, request that building T-6220 be designated for MEDDAC use, therein to permit MEDDAC to be able to vacate the T-12000 area (minus Blood Bank), if internal partitioning is accomplished within Building T-6220.

There are also a few pieces of equipment within T-6220 that MEDDAC would utilize if the building is assigned to MEDDAC.

The project officer for all that is stated herein is Major John R. White, Chief, Logistics Division, phone 2081/1649.

FOR THE COMMANDER:

\_\_\_\_\_  
concur/nonconcur  
\_\_\_\_\_  
concur/nonconcur

*William H. Boyd, Jr.*  
LTC, MSC  
Executive Officer

E-11

FORM 2496

REPLACES DD FORM 24, EXISTING EDITIONS



# DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

REFERENCE OR OFFICE SYMBOL

SUBJECT

ATZM-FM

Shelf-life Study

TO C, CFPD

FROM C, TSO

DATE 26 Feb 76

CMT 1

CPT Alishouse/gtp/1153

1. Laboratory and organoleptic analysis for shelf-life of the CIPF products (attached list) will begin Monday, 1 Mar 76.
2. The basic procedure and test plan are as follows:
  - a. Grouping of items will be used to the maximum extent possible.
  - b. An individual sample will be provided for each day's test to avoid contamination of the sample (Incl 1).
  - c. The samples will be taken from a single day's normal production lot of the item. The Veterinary Food Inspector, TSO, will be responsible for collecting the samples, identifying them and submitting them to the laboratory. The samples will be held at the lab throughout the test.
  - d. The laboratory and organoleptic examinations will be performed every other day, beginning with the day the samples are received and ending on the day of or the day after the requested extension period.
  - e. The Veterinary Food Inspector, TSO, will prepare a written evaluation of the sanitary condition of CIPF equipment used to process the lot from which the sample was taken.
  - f. The Veterinary Food Inspector, TSO, will perform inspections of the ingredients used to produce the lot from which the shelf-life samples are to be taken.
3. The laboratory and organoleptic examinations will include, but not necessarily limited to the following:
  - a. Standard Plate Count
  - b. Coliform Count
  - c. Appearance, texture and evidence of deterioration. The Veterinary Food Inspector, TSO, will perform these evaluations.
  - d. pH of Perfection Salad.
4. The determination of extension will be based upon the following considerations:
  - a. Potential hazard of the food item.
  - b. Assessment of sanitation controls in CIPF where <sup>layer</sup> production lots will be involved.

DA FORM 2496  
FEB 62

REPLACES DD FORM 56, EXISTING SUPPLIES OF WHICH WILL BE  
ISSUED AND USED UNTIL 1 FEB 63 UNLESS SOONER EXHAUSTED.

WUL GPO 1674-153-130, 8056



ATZM-FM

SUBJECT: Shelf-life Study

26 February 1976

c. Storage capacity and inventory control both in CIPF and in Dining Facilities. . Worst case situations will be the limiting factors and these will most likely be found in the older, smaller Dining Facilities. The Preventive Medicine Specialist, TSO, will provide this information from the Dining Facilities.

d. Microbiological results.

e. Organoleptic results.

f. Deviations from production guides or recipes that occurred when the sampled lot was produced.

5. The products to be sampled, the day of sampling and the number of samples required are shown in Incl 1. Inclosure 2 is a list of ingredients and production guides/ recipes of the test items shown on Incl 1.

2 Incl  
as

CF:  
C, CFPD



HARVEL F. ALISHOUSE

CPT, VC

Acting Chief, Technical Support Office



ANNEX F  
INGREDIENT PREPARATION ACTIVITY  
AT  
KEESLER AFB, BILOXI, MISSISSIPPI



ANNEX F

INGREDIENT PREPARATION ACTIVITY

AT

KEESLER AFB, BILOXI, MS

1. A Central Food Preparation Facility (CFPF) was established at Keesler AFB, Biloxi, MS, in late 1968 for preparation of certain foods and to process meats for transfer to dining facilities. Visits were made to Keesler AFB to observe Food Service operations. The visits were specifically to review the CFPF, as a comparison to the Fort Lee IPA, and to observe meat tempering concerning potential use in modernized Troop Issue Subsistence Activities (TISA's). These visits revealed many functions of the Keesler AFB CFPF that are an integral part of the IPA operation at Fort Lee. Reports of travel for the latest visits to Keesler AFB by NARADCOM and TSA personnel are at Inclosures 1 and 2.
2. The Keesler AFB CFPF produces primarily Ingredient Preparation type items similar to the Fort Lee IPA. Other products prepared include some entree items (lasagna, breaded chicken, spareribs and marinated meats). French fries and foil wrapped baking potatoes are also prepared and meat is tempered in this facility. The Keesler facility does not prepare gelatin salads as the Fort Lee facility does. Central preparation of food items at Keesler was reported to have saved 13 man-years in the six dining facilities operated on base. (In 1976, Keesler personnel estimated a savings of 30-40 personnel because of the CFPF.) Functions removed from dining facilities included vegetable peeling, chopping, and cutting/dicing and meat slicing. The related pieces of equipment were removed from dining facilities with transfer of these functions to the CFPF. Individual CFPF item production quantities are at Incl 2 to Incl 2.
3. The Keesler CFPF is divided into three functional areas: storeroom, processing area and holding area. The total work force of 13 permanent Civil Service employees and ten contract KP type workers support six consolidated dining facilities feeding an average of 11,000 to 12,000 meals per day. The staff works as a well organized team. The work is accomplished with minimal supervision in a very efficient and timely manner to satisfy the requests of the dining facilities. While preparing food items to support up to 12,000 meals per day, Keesler personnel estimated the facility and equipment have the capability of supporting up to approximately 36,000 meals per day.
4. The only problem noted during the most recent visit was that quality control was not an active, positive part of the management of the operation. There was no quality examination apparent at any stage of



production, which is contrasted to the active program at Fort Lee. Sanitation inspections were rarely performed during production. In 1976, the Base Veterinarian published a shelf-life guide that is being used in the CFPF and dining facilities. The salad dressings and cooked salads are acidified to hold down bacterial growth. This action, coupled with the short prepare/serve times (24-76 hours) is primarily responsible for the good history of food safety for the CFPF operation.

5. The central production facility is regarded very highly by dining facility managers and is considered a significant improvement over similar preparation activities at each dining facility. The CFPF provides for delivery of high quality products to the dining facilities while reducing facility, personnel and processing equipment requirements and overall food costs. Trip reports beginning in 1976 have indicated that one of the most impressive aspects of the Food Service Program is the attitude of all key personnel, exemplified by their genuine sense of pride in being a part of the Base Food Service Program.





DEPARTMENT OF THE ARMY  
US ARMY NATICK RESEARCH and DEVELOPMENT COMMAND  
NATICK, MASSACHUSETTS 01760

REPLY TO ATTENTION OF:

DRDNA-WTA

27 February 1979

SUBJECT: Report of Travel - Keesler AFB

LTC James E. Turner  
US Army Troop Support Agency  
ATTN: DALO-TAE  
Fort Lee, Virginia 23801

Dear Col Turner:

At the request of Mr. Justin M. Tuomy, Chief, Animal Products Group,  
a copy of subject document is enclosed for your information and files.

*Edward R. Baush*

EDWARD R. BAUSH  
Food Technologist  
Animal Products Group  
Food Engineering Laboratory

Inclosure 1

F-3



DRDNA-WTA

14 February 1979

MEMORANDUM FOR RECORD

SUBJECT: Report of Travel - Mr. E. R. Baush, MAJ Paul Caron and  
CW2 R. Stephan to Keesler AFB, Biloxi, MI on 5-8 Feb 79.

1. PURPOSE OF TRAVEL:

To meet with central food preparation kitchen personnel; to observe the food preparation facilities and operation; to obtain data and information related to meat tempering and handling procedures used in preparing meats for issue to dining facilities.

2. PERSONNEL CONTACTED:

LTC Whiting - Services Officer  
Mr. J. Dickson - Food Service Officer  
Mr. H. Caviness - Ass't Food Service Officer  
LTC Brewer - Base Veterinarian  
Mr. A. Willis - CFPF Supervisor

3. GENERAL DISCUSSIONS:

Before observing the food preparation facilities we met with the personnel listed in 2, above, to discuss the purpose of our visit and to explain NARADCOM's plan to evaluate meat tempering systems for use in modernized Troop Issue Subsistence Activities (TISA).

The central food preparation operation at Keesler was started in late 1968. Mr. Dickson briefly explained that the facility was expanded in four phases. Phase I involved the preparation of large bulk and labor intensive vegetable items and the thawing of meats under controlled temperature and sanitary conditions. Phase II involved the preparation of salad materials and ingredients and simple pre-preparation of meats, such as slicing bacon and luncheon meats and preparation of meat loaf, sausage patties, and meat balls. Phase III involved the preparation of condiment mixtures, garnish ingredients, cold salads (potatoe, cole slaw), and preparation of simple entree items, e. g. lasagna, etc. Phase IV involved the preparation of sauces and mixes for use with hot entrees, i.e. spaghetti sauce, cocktail sauce, cole slaw dressing, etc.

It was understood that other phases were planned for more complex operations, i.e. preparation, cooking, packaging, and freezing of bulk and individual entree items, but these phases have not yet been implemented.

Mr. Dickson then briefly explained the operation of the central food preparation kitchen (CPK), the distribution system, and relationship of the CPK with the commissary troop issue activity and dining halls. He



DRDNA-WTA

14 February 1979

SUBJECT: Report of Travel - Mr. E. R. Baush, MAJ Paul Caron and  
CW2 R. Stephan to Keesler AFB, Biloxi, MI on 5-8 Feb 79

indicated that the CPK was currently supplying rations for six (6) dining facilities serving 12,000 meals per day, but that the facility has the capacity for preparing materials for 36,000 meals per day. At the completion of the meeting, Mr. Willis escorted us through the CPK and dining facilities, explaining each phase of the operation in detail. The following is a detailed account of the information obtained.

#### 4. OPERATING PROCEDURES:

A. Ordering Schedules. Scheduling involves coordination between the dining facility, CPK, and the Commissary Troop Issue Activity. It is important that this be well planned to assure that proper supplies are on hand for preparation and delivery of necessary materials to the dining halls on schedule. The CPK is an entity separate from the issue activity. In addition to meat tempering and preparation of certain foods, it serves as a ration breakdown and delivery service for the physical movement of all subsistence (except direct delivery vendor foods) from the Commissary Issue Activity and other receiving points to the dining facilities. Stock control is a significant function of the CPK operation.

Dining halls are required to submit their requirements for salads, salad dressings and other similar items to the CPK on a daily basis. Meat requirements must be submitted four days in advance of date used. Dry good requirements may be submitted three times weekly. Food items processed in the CPK are received from the Commissary Troop Issue Activity. The CPK requests produce items twice weekly. Meat items are ordered and received three times weekly and dry goods once weekly. Direct delivery vendor items are ordered as needed.

Upon receipt of dining hall orders, the requirements are consolidated and a determination made of the ingredients necessary to prepare requested items in the CPK.

B. Facilities and Equipment. The CPK activity encompasses an area of approximately 7,000 sq. ft. divided into the following functional areas:

##### SIZE

##### USE

1. 36' x 46'

Bulk meat tempering and storage of carts, racks and pans. Refrigerated 40-45° F.

2. 45' x 72'

Processing of vegetable and meat items. Refrigerated 40-45° F.



DRDNA-WTA

14 February 1979

SUBJECT: Report of Travel - Mr. E. R. Baush, MAJ Paul Caron and  
CW2 R. Stephan to Keesler AFB, Biloxi, MI on 5-8 Feb 79

SIZE

USE

3. 20' x 45'

Cooking of meats and noodles,  
potatoe peeling, washing and  
sanitizing.

4. 18' x 40'

Chill room - storage and cooling.

5. 20' x 25'

Freezer - storage and cooling.

The major basic pieces of equipment required for use in the operation are as follows:

EQUIPMENT

USE

Urschel Model GKA-8 (1)  
Hollymatic Meat Former (1)  
Bacon Slicer (2)  
Hobart VCM chopper (3)  
Disposals (3)  
Rolling racks (12)  
Stainless steel tubs (3)  
Various tables, pans,  
trays, utensils  
Potatoe peelers (3)  
Scales (2)

Cut vegetables and meats  
Form meatballs or patties  
Slice bacon and meat  
Chop and mix  
Waste disposal  
Processing and delivery  
Processing  
Processing  
  
Peeling potatoe  
Weighing finished materials

In addition, a vacant dining hall is used as an extension to the CPK, and its food preparation facilities and equipment are used to pre-prepare and slice various food items.

C. Preparation. Processing in the CPK prepares raw food items so they are ready to be served or cooked or reheated prior to serving, when received at the dining facility. All containers leaving the CPK are clearly marked with item name, date, time of packaging, and destination dining hall.

1. MEATS - Large quantities of raw frozen meats are partially thawed and made oven ready. Oven roasts, pot roasts, boneless turkey rolls, R.T.C. Poultry, and other main entree items are held for 24 hours @ 40-42° F. The items are then removed from the boxes (individual over-wraps if any are removed) and placed in appropriate roasting pans and covered with enveloping plastic bags. The product is then delivered to the dining hall on the same day, held overnight at 40-42° F, and prepared the following day. Total thawing time for these items is approximately 55 hours. Examination of oven roasts at the dining hall prior to use indicated that the center of the roasts had not completely



DRDNA-WTA

14 February 1979

SUBJECT: Report of Travel - Mr. E. R. Baush, MAJ Paul Caron and  
CW2 R. Stephan to Keesler AFB, Biloxi, MI on 5-8 Feb 79

thawed.

Cut-up chicken is held for 48 hours at the CPK. The chicken is then trayed, covered, marked, and delivered to the dining hall where it is prepared for use on the same day.

Items such as meat loaf, salisbury steak, stuffed peppers, etc., are pre-prepared but not cooked. The ground beef to be used for these items is removed from boxes held at 40-42° F for approximately 24 hours. Meat loafs, salisbury steaks, and stuffed peppers are then formed to a uniform weight and shape. The products are placed in appropriate containers for delivery to the dining halls where it is prepared for use on the same day.

Lasagna requires cooking of sauce and noodles, chopping of hard cheese, mixing cottage cheese with other ingredients, and layering in pans. The thawing time for the ground beef, delivery, and use schedule are the same as for meat loaf.

Meat items, such as ham and bacon, that require slicing are held for approximately 20-24 hours at 40-42° F, then sliced. Ham slices are bagged in 5 lb. units, and bacon slices are rolled in wrapping paper (5 lb. units). The items are delivered to the dining hall on the same day as prepared.

Certain meat items such as beef patties, pork slices, fish portions, frankfurts, etc., are sent directly to the dining hall in the frozen state. In such instances the CPK's only function is to mark each case with the appropriate dining hall destination.

In the vacant dining hall used as the extension of the CFPPF, various other meat items are prepared. Luncheon meats are thawed approximately 20-24 hours, sliced and bagged in 5 lb. units. Oven roasts and corned beef are thawed approximately 20-24 hours, cooked, cooled, sliced, and handled the same as luncheon meats. All sliced meats are delivered to the dining hall on the same day they are prepared.

Meat sauces (spanish, taco, barbeque, pizza, and others) are prepared, cooked, and packed into rigid plastic tubs for delivery to dining halls.

In addition to above, special meat processing is accomplished. Meats are marinated (5 days) for use in saurbraten and shishkabob, and spare-ribs are cut into portions.

2. NON-MEAT ITEMS- Although our basic mission concerned meat thawing and handling, it should be noted that a considerable pre-preparation of vegetable items were carried out in the CPK. Processing of



DRDNA-WTA

14 February 1979

SUBJECT: Report of Travel - Mr. E. R. Baush, MAJ Paul Caron and  
CW2 R. Stephan to Keesler AFB, Biloxi, MI on 5-8 Feb 79

vegetables involves cleaning and converting the various produce into ready-to-use items. For example, lettuce is cut into wedges, shredded or leafed and, also, prepared into tossed or garden salads. Carrots are diced, sticked, and french cut. Green peppers and onions are sliced and diced. Cabbage is converted into cole slaw. Potatoes are peeled and foil wrapped for baking, diced, sliced, quartered, shredded, (breakfast cut), or cut for french fries. Potatoes are treated prior to bagging with bisulfite to prevent enzymatic discoloration. The prepared produce is weighed, placed in plastic bags and delivered to the dining halls to be used on the same day.

In the CPK extension potatoe salad (acidified), salad dressings, and peeled boiled eggs are prepared packed in rigid plastic tubs and delivered to the dining hall for immediate use.

D. Delivery. Two 2½ ton refrigerated trucks are used to deliver perishable items. One 1½ ton covered truck is used for delivery of non-perishable goods. All perishable items are delivered in the AM and non-perishable items in the PM.

E. Transfer Costs. All goods transferred from the Commissary Activity to the CPK are at material cost. The CPK transfers all goods to the dining hall at the same material cost or material cost divided by yield for those foods undergoing some form of preparation.

F. Labor Requirements. The bulk of the labor occurs from 2400 to 0800 Hrs. daily. The total CPK operation is performed by a force of 22 personnel as follows:

Food Service Supervisor	1
Inventory Management Specialist	1
Accountant	1
Cooks	6
Truck Drivers	3
KP Labor (contract)	<u>10</u>
TOTAL	22

G. Dining Facilities. Three dining halls were visited to observe the use of CPK prepared items and to obtain managers opinions regarding acceptability and advantages and disadvantages. Each dining hall was found to be well equipped with two 40° F refrigerated rooms and a 0° F freezer that provided ample capacity to store the flow of goods from the CPK prior to use. The manager spoke highly of CPK pre-prepared items because it relieved them of the messy and labor intensive part of food preparation and the need for equipment and space to accomplish the same.



DRDNA-WTA

14 February 1979

SUBJECT: Report of Travel - Mr. E. R. Baush, MAJ Paul Caron and  
CW2 Stephan to Keesler AFB, Biloxi, MI on 5-8 Feb 79

H. Shortcomings. Although this operation appeared to work well for the last nine years, it did demonstrate some shortcoming which should be designed out of any further operation. Specifically, special attention should be given to flow patterns of food & equipment, segregation of incompatible materials and processes, and designed-in sanitary handling of containerized food during both preparation & storage.

## 5. CONCLUSION

The CPK production facility at Keesler AFB is regarded very highly by dining hall managers and considered a significant improvement over carrying out of similar pre-preparation activities at each dining hall. Its function permits the delivery of high quality products to the dining halls and a means to consolidate recipes, facilities, personnel resources, processing equipment, and food costs. Some of the significant advantages cited for use of the CPK facility are:

1. Reduction in food preparation equipment, food preparation area, and personnel in dining halls.
2. Effective utilization of personnel.
3. Improved quality and yields.
4. Elimination of unsanitary pre-preparation food handling, related clean up, and handling and disposal of boxes, plastic wraps, etc. from the finished food preparation area.

The thawing and tempering of meats is an important part of the CPK operation incorporating all of the above advantages. In addition it provides a means to accomplish this under strict temperature control and proper sanitary conditions.

The CPK removes messy, labor and equipment intensive operations from the dining halls to one controlled area, providing dining hall personnel ~~more~~ time for meal preparation and service to the troops, with the additional advantage of reduced operating costs.

The personnel worked with at Keesler AFB were highly enthusiastic and proud of the operation. They were very cooperative in providing information and allowing us to view facilities and operations. The information will be helpful in FEL's proposed plan to evaluate systems and procedures for tempering meats at the TISA's.

*Edward R. Baush*  
EDWARD R. BAUSH  
Animal Products Group  
Food Engineering Lab

*Paul Caron*  
MAJ PAUL CARON  
Animal Products Group  
Food Engineering Lab

*Robert L. Stephan*  
ROBERT L. STEPHAN  
Military Requirements Grp  
Food Engineering Lab



24 April 1979

## MEMORANDUM FOR DIRECTOR, CONCEPTS AND SYSTEMS DIRECTORATE

SUBJECT: Report of Visit to Keesler Air Force Base, Biloxi, MS

SECTION I. PURPOSE

1. To observe Food Service operations with particular interest in Central Food Preparation Facility.

SECTION II. PERIOD COVERED BY REPORT

2. Period covered by report is 20-23 March 1979.

SECTION III. KEY PERSONNEL CONTACTED

3. The personnel contacted were:

LTC H. L. Whiting	- Chief Service Officer
LTC Brewer	- Vet Officer
MSG O. Mills	- Food Service Supt.
Mr. Jesse Dickson	- Food Service Officer
Mr. A. J. Willis	- Supervisor, Central Prep.
Mr. H. C. Ashley	- Supervisor, Bakery
Mr. E. V. Hughes	- Dining Facility Supt., 3101
Mr. C. Nunley	- Dining Facility Supt., 4812
Mr. A. Barkow	- Dining Facility Supt., 7102
Mr. E. Williams	- Dining Facility Supt., 7103
Mr. V. Polenz	- Dining Facility Supt., 7401
Mr. J. Sellers	- Dining Facility Supt., 7502

SECTION IV. OBSERVATIONS

4. Central Food Preparation Facility (CFPF): The Central Food Preparation Facility at Keesler AFB was established for preparation of certain foods and processing of meats for transfer to dining halls. For example, in CFPF, potatoes, fresh vegetables and fruits, sauces and meats are processed for all dining halls thereby eliminating these tasks in individual facilities. The establishment of the CFPF saved 13 man-years by consolidation of the labor involved with equipment, such as potato peelers, vegetable choppers, vertical cutter mixers and meat slicers. These pieces of equipment were removed from all dining halls and the incurred work transferred to CFPF.



24 April 1979

SUBJECT: Report of Visit to Keesler Air Force Base, Biloxi, MS

5. The food items processed in the CFPF are received at the commissary troop issue warehouse and commissary store. The dining halls are required to submit request on AF Forms 287 and 129 to both the Central Food Preparation Facility and the Commissary Troop Issue warehouses. Dry and cold storage items are requested from the commissary and prepared items are requested from CFPF, who, in turn, request the raw ingredients required for preparation from the commissary. The commissary issues the raw ingredients to CFPF.
6. On Keesler AFB, the commissary cold storage warehouse and the CFPF are located in the same building. The commissary dry storage warehouse is located in an adjacent building.
7. Deliveries are made three times a week from the commissary to the dining halls and to CFPF. The Central Pastry Kitchen (CPK) receives rations once a week. CFPF issues to the dining halls six days per week, CPK five days a week, direct delivery items are received six days a week. Due to this system, dining hall inventories range between three and seven thousand dollars depending on the day during the delivery cycle the inventory is taken. CFPF's inventory ranges between thirteen and thirty-six thousand dollars.
8. Delivery of items prepared in CFPF are made with two 2-1/2 ton refrigerated trucks for the delivery of perishable items and one covered 1-1/2 ton truck for the delivery of non-perishable items. All deliveries are made in a manner allowing for timely preparation in the receiving facility.
9. The CFPF is divided into three functional areas: Storeroom, processing area, and holding area. The work force consists of 13 Civil Service employees, broken down as follows: two supervisors; one office personnel; one stock clerk; three drivers; and six production workers. Supplementing the Civil Service workers are ten contract personnel that work on production and clean-up. The total work force is 23 personnel. A breakdown of civilian work grades are listed at Incl 1. *A list of equipment and room sizes are listed at Incl 1A.*
10. The work day starts at 2400 hours with one supervisor coming in to prepare sauces, such as BBQ, pizza, cocktail, taco, Spanish and tartar. These sauces are prepared and packaged in reusable plastic gallon containers. The main work force arrives at 0200 to start the days food preparation. The items prepared, along with a monthly production, are listed at Incl 2. The processing of these items includes, but is not limited to: cleaning vegetables; peeling potatoes; cooking potatoes; boiling eggs and peeling eggs; cooking and slicing roasts, slicing cold cuts; cooking macaroni and rice; bagging vegetables and fruits; packaging and marking each item prepared with date/time prepared.
11. The total quantity of food items prepared in CFPF is based on dining facility requests. The dining halls submit AF Form 129 for salads, salad dressing, and other items on a daily basis to CFPF. The orders received by CFPF are filled the following day. Dining halls prepare the AF Form 129 taking into account menu requirements, items on hand and CFPF procedures and



DALO-TAE-D

24 April 1979

SUBJECT: Report of Visit to Keesler Air Force Base, Biloxi, MS

capabilities. Dining halls submit AF Form 287 for prepared meat items and frozen meats. Upon receipt of the dining hall orders, the supervisor of CFPF consolidates the AF Form 129 and AF Form 287 on the appropriate DD Form 157. An outline and example of forms are listed at Incl 3.

12. The CFPF preparation works like a well organized team with each member aware of his or her duties. The work is accomplished with minimal supervision in a very efficient and timely manner. Several time measurements were made:

a. One man abrasively peeled 2,000 pounds of potatoes in 90 minutes using one dining hall size abrasive peeler.

b. One man sliced 40 pounds of slab bacon in 10 minutes into 5 pound rolls.

c. Two people hand-peeled 50 pounds of large Spanish onions in eight minutes.

d. The Urschel cutter dicer was operated for 1 hour 45 minutes. The first hour was used to dice salad items and the remaining 45 minutes were used on potatoes.

13. Control of quality for the Keesler CFPF was not an active, positive part of the management of the operation. The quality of the end items was a function of the raw material quality and the habits of the employees. There was no apparent quality examination at any stage of production. When questioned, the CFPF manager stated that they used the AFM 146-12, "Armed Forces Recipe Service," for their basic formulations. However, no formal mechanism for verifying the formulations was observed. Several things were seen that would indicate that no control was being applied.

a. Bagged radishes were not sorted prior to being chopped. Several rotten radishes went into the salad.

b. Lettuce was not adequately washed before being chopped. Field dirt was seen in the finished product.

c. Finished rolls of sliced bacon were not randomly test weighed. One that was weighed contained 4.5 pounds instead of 5 pounds.

d. Antioxidant (a food additive) was not measured when being applied to potatoes. The time of contact was not controlled and in one case remained on the potatoes for several hours.

14. Sanitation was observed to be poor during production. The Base Veterinarian indicated a high regard for the sanitation standards maintained by the CFPF, but sanitation inspections were rarely performed during production. Several



24 April 1979

SUBJECT: Report of Visit to Keesler Air Force Base, Biloxi, MS

serious deficiencies were noted that underscore the need for surveillance during production:

a. A tray was located beneath the slicing machine for temporary storage of ham end pieces. The tray was exposed to lubricating fluids dripping from the machine.

b. A water hose used for cleanup is stored on the floor. It is also used to provide processing water and is frequently dipped into vats and touches food.

c. Sauces were mixed by hand with no regard for the cleanliness of the hands and arms of the person doing the mixing.

d. A single piece of equipment was used for multiple classes of foods without adequate cleaning and sanitizing between classes.

e. Delivery trucks are refrigerated. However, it was observed that they were not precooled and the units were not running during loading. Loading required approximately two hours during which time chilled foods were exposed to outside ambient temperature and humidity.

15. In 1976, the Base Veterinarian published a shelf-life guide, Incl 4, that is being used in CFPF and in the dining halls. The salad dressings and cooked salads are acidified to hold down bacterial growth. This action, coupled with the short prepare - serve times (24-76 hours) is primarily responsible for the good history of food safety for the CFPF operation at Keesler AFB.

16. Keesler has six consolidated dining halls feeding an average of 11,000 meals per day. The operation is run by civilian personnel both with Civil Service employees and contract hire. In September, the entire operation will be converted to a contract operation, including the CFPF. Listed at Incl 5 is a dining hall schedule and a few examples of what is served.

#### SECTION V. CONCLUSION

17. The CFPF operation appeared very smooth on the surface with a very high production efficiency. However, monitoring the overall production revealed inefficiencies. The main problem as we see it is the apparent lack of a quality control program. This program should provide SOP's, establish production procedures, follow standard recipes, use scales or volumetric measurements and most important of all have a good sanitation program.

#### SECTION VI. RECOMMENDATIONS

18. None.



DALO-TAE-D

24 April 1979

SUBJECT: Report of Visit to Keesler Air Force Base, Biloxi, MS

SECTION VII. ACTION TAKEN

19. None.

5 Incl  
as

*Richard L. Helmer*

RICHARD L. HELMER  
Food Technologist  
Systems Development Division

*Harvel F. Alishouse*

HARVEL F. ALISHOUSE  
MAJ, VC  
Veterinary Staff Office



KEESLER AIR FORCE BASE

STAFFING

FOR

CENTRAL FOOD PROCESSING FACILITY

1. 13 Civilian Workers

2. WS-7 - 1

WL-8 - 1

WG-8 - 8

WG-6 - 3

3. WS-7-5 Sup.

WL-8-4 Work Leader

WG-8-2 Cook

WG-8-2 Cook

WG-8-3 Cook

WG-8-4 Cook

WG-8-4 Cook

WG-8-4 Cook

WG-8-5 Cook

WG-8-5 Cook

WG-6-2 Driver

WG-6-4 Driver

WG-6-5 Driver

enc 1



EQUIPMENT AND ROOM SIZES FOR CFPF

<u>I. Equipment</u>	<u>Quantity</u>	<u>Use</u>
Urschel Model GKA-8, Dicer	1	Dices and slices vegetables.
Hollymatic Meat Former	1	Forms meatballs and/or patties.
Slicer	2	Slices Bacon, ham, cold cuts, Meats.
Hobart VCM Chopper	3	Chops and mixes.
Disposals	3	Chops up wastes.
Rolling Racks	12	Storage of products.
Stainless Steel Tubs	3	Holds processed vegetables.
Potato Peelers (dorsative)	3	Peels potatoes.
Scales	2	Used to weigh vegetables

- II. Facilities: The CFPF activity consists of an area of approximately 7,000 sq ft as follows:

<u>Room</u>	<u>Size</u>	<u>Use</u>
Meat Tempering	36' x 46'	Bulkmeat tempering and storage of carts, racks and pans. Refrigerated to 40-45°F.
Vegetable Processing	45' x 72'	Processing of vegetable and meat items. Refrigerated to 40-45°F.
Cooking, Peeling Room	20' x 45'	Cooking of meats and noodles, potato peeling, washing and sanitizing.
Chill Room	18' x 40'	Storage and cooling.
Freezer	20' x 25'	Storage and Cooling.

line 1A



**ITEMS PREPARED BY CENTRAL FOOD  
KEESLER AFB, MS**

<u>ITEM</u>	<u>QUANTITY</u>	<u>INDIV ITEMS</u>
TOSSED SALAD	3,000 per month (lb)	BULK MEAT 90,000
COLE SLAW	2,550 "	lb per month.
CARROTS DICED	2,250 "	
CARROTS STICKS	1,000 "	FRUIT-90,000 lb
CARROTS FR. CUT	500 "	per month.
ONIONS DICED	3,000 "	
ONIONS SLICED	3,300 "	DRY AND COLD DEL.
RADISHES WHOLE	630 "	3 TIMES PER WK.
LETTUCE WEDGES	2,550 "	
PARSLEY	600 "	
LETTUCE LEAVES	360 "	
GARDEN SALAD	2,850 "	
LETTUCE SHREDDED	1,650 "	
GREEN PEPPERS SLICED	750 "	
GREEN PEPPERS DICED	1,350 "	
CUCUMBERS	2,700 "	
SALISBURY STEAK	600 lb. per Order	
MEATBALLS	400 "	
STUFFED PEPPERS	600 "	
BREADED CHICKEN	30,600 lb. per month	
SAUSAGE PATTIES	5,100 "	
HAM SLICED BREAKFAST	3,300 "	
BACON SLICED	7,500 "	
COLE SLAW DRESSING PLAIN	180 Gal. Containers per month	
" with MUSTARD	150 "	
POTATOE SALAD PLAIN	480 "	
" WITH MUSTARD	300 "	
CLUB SALAD	450 "	
BBQ SAUCE	360 "	
PIZZA SAUCE	270 "	
COCKTAIL SAUCE	56 "	
TACO SAUCE	20 "	
SPANISH SAUCE	90 "	
TARTAR SAUCE	210 "	
HAM STEAKS	300 lb per Order	
CHOPPED CHEESE CHEDDAR	2,520 lb per Month	
" MOZZARELLA	450 "	
FR. FRIES CRINKLE CUT	30,000 "	
POT. FOIL WRAP	2,000 "	
" SML DICED	700 lb per Order	
" LARGE DICED	720 "	
" SLICED	750 "	
" FR. BAKED	700 "	
" QTRD	700 "	
MEATLOAF	450 "	
SPARERIBS	600 "	
LASAGNA	72 2" pans per order	
Marinated Meat (SHISHKABOB/SAUERBRATEN)	600 lb per order	



TALLY ☐ IN ☐ OUT

REQUISITION OR PO NUMBER

DATE

STATION

KEESLER AIR FORCE BASE, MS

CARRIER

CONSIGNOR

CENTRAL FOOD PREPARATION FACILITY

B/L NUMBER

CONSIGNEE

DINING HALL #

CAR NUMBER AND INITIALS

AUTHORITY

SEAL NUMBERS

CONTAINERS  
OR  
PIECESUNITS  
PER  
CON-  
TAINER

CONTENTS

UNIT

TOTAL UNITS

UNIT  
SALES  
PRICE

TOTAL VALUE

TOSSED SALAD

LB

COLE SLAW

LB

CARROTS, DICED

LB

CARROTS STICKS

LB

CELERY, DICED

LB

CELERY STICKS

LB

ONIONS PREPARED

LB

POTATOES, BREAKFAST

LB

POTATOES, FRENCH FRIES

LB

POTATOES, PREPARED

LB

POTATOES PREPARED

LB

LETTUCE WEDGES

BAG

LETTUCE LEAVES

BAG

GARNISH PACKS

PACK

PARSLEY PREPARED

BAG

GARDEN SALAD

LB

SHREDDED LETTUCE

LB

PEPPERS, GREEN

LB

CHICKEN BREADED

LB

SAUSAGE PATTIES

LB

SAUSAGE LINKS

LB

HAM, BREAKFAST

LB

BACON SLICED

LB

CUCUMBERS

LB

EGGPLANT

LB

PACKER (Tally out unit)

CHECKER

I CERTIFY THAT THE ABOVE LISTED ARTICLES (As  
per to Veterinary Inspection) WERE INSPECTED BY ME  
AND THAT THEY CONFORM TO THE CONTRACT  
REQUIREMENTS.

RECEIVED THE ABOVE LISTED ARTICLES IN APPAR  
GOOD ORDER AND CONDITION (Except as noted)

SIGNATURE

INSPECTOR'S SIGNATURE

GRAND TOTAL

DATE

F-18

ENC 2



[illegible]



2. Flow Chart for Prepared Items from CFPF:

- a. Dining hall request (AF Forms 287 & 129) for prepared items made.
- b. Submitted to CFPF personnel.
- c. Consolidated onto DD Form 157.
- d. CFPF personnel prepare AF Form 287 to request necessary raw ingredients from Commissary.
- e. AF Form 287 submitted to SVF for control number.
- f. AF Form 287 submitted to Troop Issue accounting sections for control number.
- g. Submitted to cold or dry storage warehouse where quantity issued is filled in when items are placed on loads.
- h. Submitted to troop issue accounting section where unit price is entered.
- i. Cold storage items are signed for by CFPF storeroom personnel and transferred from cold storage warehouse to CFPF storage areas. Dry storage items are signed for by SVF truck drivers and delivered to CFPF storeroom personnel where they are placed in storage areas.
- j. AF Form 287 posted to AF Form 147 in col B by CFPF storeroom personnel.
- k. Items in storage requested by senior cook on AF Form 148 for preparation.
- l. Items taken out of storage by storeroom personnel.
- m. Raw ingredients processed into finished products.
- n. Amounts actually produced entered on DD Form 157.
- o. AF Form 148 used for posting Col C & D on AF Form 147 by CFPF storeroom personnel.
- p. Original dining hall requests (AF Forms 287 and 129) completed by CFPF personnel to show quantity issued, unit price, total cost, and total.
- q. Finished products loaded onto trucks with AF Forms 287 and 129 for delivery to dining halls.
- r. Items received verified by signature by dining hall personnel.
- s. Items placed in dining hall storage areas by storeroom personnel.
- t. AF Forms 287 and 129 posted to col B on AF Form 147 by dining hall storeroom personnel.
- u. Items in storage requested by senior cook on AF Form 148.



XXXXXXXXXXXXXXXXXXXX Bad  
KEESLER AFB, MS

DATE

[illegible]

DD FORM 157



## DAVID

DD FORM 157



101

[illegible]DD FORM 157  
1 FEB 66

Ans: 2 and 3.



Effective 18 October 1976

Fresh vegetables are washed, cleaned and cut, shredded or chopped into various sizes required by applicable recipes. They are prepared and packaged under refrigeration, 50°F or less.

<u>ITEM</u>	<u>HOLDING TIME AFTER PREPARATION</u>	<u>TEMPERATURE REQUIREMENT</u>
Radishes	72 hours	
Carrots, diced	72 hours	
Carrots, sticks	72 hours	
Celery, diced	72 hours	
Celery sticks	72 hours	
Lettuce Leaves	72 hours	
Lettuce Wedges	72 hours	
Lettuce Shredded	72 hours	
Parsley	72 hours	
Green Peppers, diced	72 hours	
Green Peppers, whole	72 hours	
Eggplant, sliced	72 hours	
Corn on the Cob	72 hours	
Green Onions	72 hours	
Cucumbers	72 hours	
Endive	72 hours	
Escarole	72 hours	
Cabbage, white	72 hours	
Cabbage, red	72 hours	
Onions, dry	72 hours	
Squash	72 hours	
Potatoes, fresh	72 hours	

Recommend day and time be placed on container showing time of preparation.



Potatoes are peeled, washed and cut into various sizes. Immediately after cutting they are placed in water containing anti-oxidant (Sodium Bisulfite and Citric Acid) for 1-1/2 minutes. The potatoes are packaged and stored in CFPF from 1 to 5 days.

Salads, salad dressings, and sauces are prepared, packaged or placed in containers under refrigeration, 50°F or less.

<u>ITEM</u>	<u>HOLDING TIME AFTER PREPARATION</u>	<u>TEMPERATURE REQUIREMENT</u>
Cole Slaw Dressing	72 hours	45°F. or below
Thousand Island Dressing	72 hours	"
French Dressing	72 hours	"
Vinegar & Oil	72 hours	"
Potato Salad	ph below 5 24 hours	ph above 5 4 hours
Club Salad	" 24 hours	" " " " "
Fruit Salad	48 hours	"
Barbecue Sauce	96 hours	"
Spanish Sauce	96 hours	"
Cocktail Sauce	96 hours	"
Pizza Sauce	96 hours	"
Tartar Sauce	24 hours	"
Taco Sauce	96 hours	"

Ground meat items are thawed, seasoned, mixed, and molded into various forms. The items are prepared under refrigeration, 50°F or less.

<u>ITEM</u>	<u>HOLDING TIME AFTER PREPARATION</u>	<u>TEMPERATURE REQUIREMENT</u>
Sausage Patties, Pork	24 hours	45°F or below
Meat Loaf, Veal	24 hours	"
Meat Loaf, Beef	24 hours	"
Chopped Veal Steaks	24 hours	"
Salisbury Steak, Beef	24 hours	"
Meat Balls, Beef	24 hours	"



<u>ITEM</u>	<u>HOLDING TIME AFTER PREPARATION</u>	<u>TEMPERATURE REQUIREMENT</u>
Stuffed Green Peppers, Beef	24 hours	45°F. or below
Lasagna, Beef, Cooked	24 hours	"

Breaded meat items are thawed and breaded with a flour, egg, and milk mixture. The items are prepared under refrigeration, 50°F. or less.

<u>ITEM</u>	<u>HOLDING TIME AFTER PREPARATION</u>	<u>TEMPERATURE REQUIREMENT</u>
Swiss Steak	24 hours	45°F. or below
Veal Slices	24 hours	"
Chicken, cut-up	24 hours	"

The meats indicated are thawed, sliced, chopped or cut into portion size. They are prepared under refrigeration, 50°F. or less.

<u>ITEM</u>	<u>HOLDING TIME AFTER PREPARATION</u>	<u>TEMPERATURE REQUIREMENT</u>
Ham, Smoked, Sliced	48 hours	45°F. or below
Ham, Smoked, Chopped	30 hours	"
Spareribs, Pork, cut-up	24 hours	"
Bacon, Smoked	72 hours	"

~~The meat items indicated are defrosted at controlled temperature, 35-40°F. and transported to~~  
the dining halls.

<u>ITEM</u>	<u>HOLDING TIME AFTER PREPARATION</u>	<u>TEMPERATURE REQUIREMENT</u>
Oven Roast, Beef	72 hrs not cut or sliced	45°F. or below
Pot Roast, Beef	72 hrs "	"
Grill Steak, Beef	48 hrs "	"
Swiss Steak, Beef	48 hrs "	"
Diced Beef	48 hrs "	"
Ship Round, Beef	72 hrs not sliced - continuous refrigeration	"
Corn Beef	72 hrs "	"
Ham, Smoked, Roll	72 hrs "	"

ch 2 25-26-3



<u>ITEM</u>	<u>HOLDING TIME AFTER PREPARATION</u>	<u>TEMPERATURE REQUIREMENT</u>
Lamb Chops	48 hrs not sliced - continuous refrigeration	45°F. or below
Lamb Roast	72 hrs	"
Pork, Ham	72 hrs	"
Pork, Loin	72 hrs	"
Veal Roast	72 hrs	"
Chicken, Whole	24 hrs	"
Duck, Whole	24 hrs	"
Cornish Hen, Whole	24 hrs	"
Turkey, Whole	72 hrs	"
Turkey, Raw	24 hrs	"
Turkey, Cook, Roll	72 hrs	"
Rabbit, Cut-up	24 hrs	"

Fresh fruit is washed and packaged in Central Food under refrigeration, 50°F or less except for those indicated by \*. These items are left in the carton and shipped to the dining halls for preparation.

<u>ITEM</u>	<u>HOLDING TIME AFTER PREPARATION</u>	<u>TEMPERATURE REQUIREMENT</u>
Apples, Eating	5 days	
Bananas	2 days	
Grapes	5 days	
Grapefruit	5 days	
Lemons	5 days	
Oranges	5 days	
Plums	5 days	
Peaches	5 days	
Honey Dew Melons	N/A	
*Cantaloupe	N/A	

due 3 to due 4.



ITEMHOLDING TIME AFTER PREPARATIONTEMPERATURE REQUIREMENT

\*Watermelons

N/A

\*Pineapple

N/A

\*Tomatoes

N/A

\*Garlic

N/A

Beef patties and seafood are shipped to the dining halls in a frozen state.

*[Signature]*  
L. C. JAN, Capt, USAF, VC  
Veterinarian



Serving Hours:

	Weekdays	Serving Lines	Saturday/ Holiday	Sunday	Serving Lines
Breakfast	0430-0730	2	0730-0930	0730-0930	2
*Lunch	1000-1300	2	*1100-1300	*1100-1300	2
*Dinner	1630-1900	2	*1630-1830	*1630-1830	2

b. Dining Hall 4812, Building 4812

Serving Lines: 2

Serving Hours:

Breakfast	0430-0730	2	0730-0930	0730-0930	2
*Lunch	1030-1300	2	*1100-1300	*1100-1300	2
*Dinner	1630-1845	2	*1630-1800	*1630-1800	2

c. Dining Hall 7102, Building 7102

Serving Lines: 2

Serving Hours:

Breakfast	0425-0730	2	Closed	Closed	
*Lunch	1000-1315	2	Closed	Closed	
*Dinner	1630-1930	2	Closed	Closed	

d. Dining Hall 7103, Building 7103

Serving Lines: 2

Serving Hours:

Breakfast	0425-0600	2	0730-0930	0730-0930	2
*Lunch	1000-1315	2	*1100-1300	*1100-1300	2
*Dinner	1630-1930	2	*1630-1830	*1630-1830	2



e. Dining Hall 7401, Building 7401

Serving Lines: 2

Serving Hours:

	Weekdays	Serving Lines	Saturday/ Holiday	Sunday	Serving Lines
Breakfast	0425-0600	2	°0730-0930	0730-0930	2
*Lunch	1000-1315	2	*1100-1300	*1100-1300	2
*Dinner	1630-1930	2	*1630-1830	*1630-1830	2

f. Dining Hall 7502, Building 7502

Serving Lines: 2

Serving Hours:

Breakfast	0425-0600	2	°0730-0930	0730-0930	2
*Lunch	1000-1315	2	*1100-1300	*1100-1300	2
*Dinner	1630-1930	2	*1630-1830	*1630-1830	2
Carry-Out Service	2030-2230	1	2030-2230	2030-2230	1

\* In all dining halls, one (1) serving line for lunch and dinner will be designated a shortorder line.

° Parade Schedule: All dining halls with the exception of 7103 and 3101 will serve Saturday parade breakfast from 0600-0800 hours. Parades are normally four (4) per year.

Christmas Holiday Period:

During Christmas holiday period, it may be necessary to close additional dining halls due to the closing of the Technical Training Schools. Christmas holiday period usually extends from approximately 20 December through 3 January.



Sample  
Salad Menu

MONDAYS

Salad

Tossed Green Salad  
Garden Salad  
Cole Slaw (M-8)  
Jellied Pear Salad  
Apple, Celery & Pineapple Salad  
Cottage Cheese  
Relish Tray - Sliced Tomatoes

Dressings

Thousand Island  
Italian  
French  
Mayonnaise  
Assorted Low Calorie  
Oil & Vinegar

TUESDAYS

Tossed Salad  
Garden Salad  
Cole Slaw (M-9-1)  
Potato Salad (M-40)  
Fresh Fruit (M-17)  
Cottage Cheese & Peach Salad  
Relish Tray  
Sliced Tomatoes

Blue Cheese  
Russian  
Italian  
Mayonnaise  
Assorted Low Calorie  
Oil & Vinegar

Sample  
Pastry Menu

MONDAY (1)

Cherry Crisp Pie  
Strawberry Shortcake w/whipped topping  
Brownies  
Chocolate Chip Cookies  
Coconut Layer Cake  
Chocolate Pudding  
Fruit Jello/Topping  
Assorted Ice Cream and Sherbet/Sundaes  
Assorted Breakfast Pastries

TUESDAY (2)

Assorted Cup Cakes  
Dutch Apple Pie  
Blueberry Pie



Plain Cake w/chocolate icing  
 Fruit Bars  
 Butterscotch Pudding  
 Fruit Jello/Topping  
 Assorted Ice Cream and Sherbet/Sundaes  
 Assorted Breakfast Pastries

Sample  
Hot Line Menu

Lunch

Tomato-Vegetable & Chef's Soup  
 w/crackers  
 Roast Beef au jus (L-5)  
 Breaded Pork Slices (L-86)  
 w/applesauce  
 Fried Chicken  
 Fried Fish  
 Swedish Meat Balls  
 Franconia Potatoes (Q-50-1)  
 Brown Gravy  
 Mashed Potatoes  
 Steam Rice  
 Buttered Broccoli  
 Scalloped Tomatoes  
 Buttered Succotash  
 Assorted Salads & Dressings  
 Hot Rolls  
 Assorted Breads - Butter  
 Assorted Desserts  
 Assorted Beverages

Lunch

Chef's Soup  
 Oyster Stew w/crackers  
 Grilled Ham Slices  
 French Fried Fish Portions  
 w/Tartar Sauce and Lemon Wedges  
 Fried Chicken  
 Fried Fish  
 Turkey a la King  
 Mashed Potatoes  
 Cream Gravy  
 French Fried Potatoes  
 Buttered Lima Beans  
 Stewed Tomatoes  
 Buttered Asparagus  
 Assorted Salads & Dressings

Dinner

Chef's Soup  
 Vegetable Soup w/crackers  
 Veal Loaf w/Mushroom Gravy (L-35-1)  
 Barbecued Beef Cubes (L-18)  
 Stuffed Frankfurters  
 Fried Chicken  
 Fried Fish  
 Mashed Potatoes  
 Steamed Rice  
 Baked Macaroni and Cheese (F-1)  
 Buttered Green Beans  
 Southern Style Greens  
 Buttered Asparagus  
 Assorted Salads & Dressings  
 Assorted Breads - Butter  
 Assorted Desserts  
 Assorted Beverages

Dinner

Chef's Choice of Soups w/Crackers  
 Roast Pork w/Applesauce  
 Spanish Steak  
 Fried Chicken  
 Fried Fish  
 Tamale Pie  
 Mashed Potatoes  
 Brown Gravy  
 French Baked Potatoes  
 Steamed Rice  
 Buttered Peas and Carrots  
 Cauliflower Polonaise  
 Assorted Salads & Dressings  
 Assorted Breads - Butter  
 Assorted Desserts



Lunch Cont'd

Hot Rolls  
Assorted Breads - Butter  
Assorted Desserts  
Assorted Beverages

Dinner Cont'd

Assorted Beverages

Each Dining Hall has two (2) menu boards, one for the main line and one for the short order line. They will be kept up to date, including the amount of calories per serving. Following the dinner meal, the supervisor will post the next day's lunch meal to the menu board.

Sample  
Standard Breakfast Menu

Assorted Chilled Fruit Juice  
Assorted Dry Cereal  
Fruit  
Grilled Sausage Patties  
Grilled Ham Slices - Slice Bacon  
Corned Beef Hash (Wed - in lieu of ham)  
Fried Eggs to Order  
Boiled Eggs - Hard/Soft  
Omelets (Ham, cheese, onion, green peper, spanish, mushroom)  
French Toast  
Griddle Cakes  
Creamed Beef on Toast  
Grilled Fried Has Brown Potatoes  
Grits - Oatmeal - Farina  
Toast - Butter - Jam - Jelly - Peanut Butter  
Maple syrup, Strawberry and Blueberry Syrup  
Catsup  
Fresh Milk, White - Chocolate - Skimmed  
Coffe - Tea  
Assorted Doughnuts and Sweet Rolls  
Biscuits

Sample  
Standard Short Order Menu

Soup of the Day w/crackers  
Hamburgers on Buns  
Cheeseburgers on Buns  
Frankfurters in Buns or Chili Dogs  
Grilled Cheese Sandwiches  
Grilled Ham and Cheese Sandwiches  
Chili Con Carne/Rice



Hot Pork and Beans  
Special of the Day  
French Fried Potatoes  
Potato Chips and Corn Chips  
Lettuce Leaves and Sliced Tomatoes  
Assorted Desserts  
Assorted Beverages  
Individual Catsup - Mustard - Salad dressing  
Sliced Hamburger Dill Pickles - Chopped onions - Pickle relish  
Tamales  
Ravioli



ANNEX G

DINING FACILITY PERSONNEL

ATTITUDES AND SKILL LEVELS



ANNEX G  
DINING FACILITY PERSONNEL  
ATTITUDES/AND SKILL LEVELS

1. During the Central Food Preparation System final IPR in December 1978, discussion took place on acceptance of CFPF products and requirements for cooks' skills related to CFPF and IPA support. A primary concern was the potential impact of an IPA on basic cooks' skills.
2. A questionnaire devised to determine food service personnel attitudes toward IPA support was completed by Fort Lee dining facility managers in February and March 1979. Summary of responses is at Incl 1. Managers overwhelmingly endorsed the IPA concept but raised the question about skill levels of cooks supported by an IPA.
3. Because of this concern, a letter was sent to Fort Lee requesting the QM School review the impact of IPA support on cooks' skills. The TSA letter and QM School response are at Incl 2. The Quartermaster School responded that the type of items prepared in the IPA require skills essential to normal cook's training and profession. Also, they indicated the QM School "does not approve of IPA if it diminishes in any way those skills of the cook which would be essential in other circumstances if IPA was not available."
4. There is a potential negative impact on cooks' skills with IPA support, but the actual impact would not be as extensive as indicated. Many items would still be prepared in dining facilities requiring the same type of skills. For instance, cooks would still prepare some salad ingredients and mix salads. Tomatoes and cucumbers are still prepared in the dining facility. Cooks would continue to prepare highly perishable sauces and dressings. Cooks would still practice "knife skills" on non-ingredient preparation items, such as vegetables for stews and other recipes, including eggplant, squash, cucumbers, tomatoes, onions, carrots and potato wedges. Dicing/cutting and mixing of meat products would not be totally removed from dining facilities as cooks continue to prepare some mixed meats such as veal loaf, sandwich spreads, chicken and turkey casseroles, and beef hash. It is also noted that dining facilities have been authorized ingredient preparation type equipment (Vertical Cutter-mixers and slicing and dicing machines) which collectively remove some of the basic "knife skill" processes from cook's duties. IPA support removes these same machine functions along with the appropriate equipment from dining facilities, while leaving many of the cook's manual functions. At inclosure 3 is a list of items not prepared in the IPA. These items would continue to require basic cook's skills.



Annex G

Questionnaire for Interview with Dining Facility Food Sergeants

This questionnaire was issued to each dining facility manager with the following results:

1. Question - What do you think of the products you receive from the Ingredient Preparation Area?

Answer - "Adequate".

"Products are well prepared".

"I think the products are very good and time saving".

"Good, troop acceptability good."

"Very good if items are rotated and sent to dining facility fresh".

"I think they are good".

"I think it is one of the best operations we have here at Ft. Lee".

"The products, so far, are great".

2. Question - What products do you like best?

Answers - "Shredded cabbage, diced onions".

"All products from Ingredient Preparation".

"Chopped lettuce, chopped and disced vegetables, sliced and diced ham and cheese, peeled potatoes".

"All". (quote of three managers).

"Cole slaw, potatoes, jello, diced ham and cheese, sliced bologna".

"Cole slaw, congealed salads".

3. Question - What products do you not like?

Answers - "Shredded lettuce, peeled potatoes".

"None".



"Lettuce".

"None, all products are good".

"Three Bean Salads are not too edible".

(Three Managers gave no comment)

4. Question - Give some specific reasons why you do not like them.

Answers - "Shredded lettuce has a tendency to age much quicker than fresh

and it is not that much of an advantage to have the potatoes

have a crust that doesn't cook".

"Lettuce, turns brown too quick".

"Very few EMS take the salad".

(Five managers didn't answer).

5. Question - What are some of the advantages of having some food products centrally prepared?

Answers - "Time saving".

"Saves time, use less personnel".

"It saves time in the kitchen and gives more time for cleaning.

"Less time for cooks, better portion control."

"Time!"

"To chop and cut vegetables takes a lot of time. If two people out of three call in sick, the chopping, cutting and baking is" (too rushed).

"Saves time and waste and the kitchen stays much cleaner and products are more uniform".

"You would not tie up a cook making salad. As it is all dining facilities are short-handed".

6. Question - How much additional help, labor-wise would you need if you had to prepare these products from scratch? What grade or rank?



Answers - "Sp/4 (2), one per shift".

"We would need at least three more personnel in grades E-4 or E-5".

"At least three more people".

"Two more cooks".

"WG-5 or Sp-4, PFC, WG-1".

"Four E-3's".

"About 1 more per shift, grade or rank makes no difference".

"For making salad and preparing potatoes, one, two additional persons would be needed. WG-1 (2 each)".

7. Question - Do you think that the skill of your cooks and apprentice cooks is being jeopardized by having some items centrally prepared?

Answers - "Having the onions diced and cabbage shredded and jello made, doesn't take any thing away from the cooks. It provides them with more time to promote their skills".

"No. It gives shift leaders more time to instruct cooks in other areas". Added comment, "Due to the size of facilities storage space, in my opinion, keeping ingredient preparation in operation is a very good idea. I feel it would be a burden on my cooks if they had to prepare all products here in this small dining facility."

"Some items, yes. It would be economically wise to keep ingredient preparation open".

"No." as reiterated by three managers. One comment added was,

"The items from Ingredient Preparation saves time, waste and items are better prepared and portion controlled". A second comment was,

"When I was under the Energy Test for about two months, my food costs went up and the kitchen was not as clean when we were cooking everything from scratch. I used CFPF items on many field problems."



It saved time, storage space and waste and cut down on the number of cooks needed".

"No. The items will not be cooked, just cut. Ingredient Preparation is good to have".

"Yes. A cook can forget by not doing his own product and he or she loses pride in the finished product. The armed service (Army) is the loser for sending that man or woman to school and not using that skill. Overall the army is losing out (Money wise) because sending personnel overseas after being under this system and have not experienced the 'game of the knife', is gaining a handicap. Civilians you can't order to the field and if you could, there would be overtime".

These comments are typical and for the most part, favorable to the Concept of Operations of the Ingredient Preparation Activity.



ATSM-DT-SF (7 Jun 79) 1st Ind  
SUBJECT: Skill Qualifications for Cooks

HQ, U. S. Army Quartermaster School, Fort Lee, VA 23801 5 JUL 1979

TO: Commander, U. S. Army Troop Support Agency, ATTN: DALO-TAE-D, Fort Lee,  
VA 23801

1. The impact on cooks' skills of having an Ingredient Preparation Activity (IPA) at an installation is quite clear. The cooks concerned will gradually lose the skills involved in preparing those dishes which are processed at the IPA. This would be unimportant if cooks were to work only in an environment where an IPA was present; however, this will not always be the case, i.e., in the field, and the crux of the matter is whether or not the skills involved are essential. We consider that many of them are.
2. During the AIT course, cooks are taught the barest of essential skills. It is during subsequent assignments as a cook that daily repetition of these essential skills builds confidence and efficiency. Without this on-job practice, the cook would remain at the learner level and he would never develop the speed necessary to meet the daily norm.
3. Of the products listed all, with the exception of potatoes, are undertaken by the cook. The cook does supervise the production of potatoes and has, therefore, a knowledge of how potato preparing equipment works. Particularly important are the skills involved in shredding, chopping and dicing salad ingredients as this encourages the practice of knife drills. The preparation of salads is also important as presentation of the product is a key factor. Slicing of meats is less important, but the preparation of meat balls, salisbury steak and meat loaf combine a number of essential skills and these items should not be prepared at IPA.
4. No doubt, it will be argued that cooks could be rotated through IPA in order to maintain skills. This is not a valid argument since the equipment that would be used there would not be common to that found day to day in the dining facility.
5. The bottom line is that we do not approve of IPA if it diminishes in any way those skills of the cook which would be essential in other circumstances if IPA was not available.
6. Point of contact relative to this subject is MAJ J. B. Bloxham, ext 2951.
7. Per FONECON between Dr. Hartson, Subsistence and Food Service Department, USAQMS, and Ms. Brown, USATSA, suspense date extended to 20 Jun 79.

FOR THE COMMANDANT:

*For Charissa Bickel* ILT AGC

100, 101  
100, 101  
100, 101

2

G-6

Inclosure 2





DEPARTMENT OF THE ARMY  
U.S. ARMY TROOP SUPPORT AGENCY  
FORT LEE, VIRGINIA 23801

7 JUN 1979

DALO-TAE-D

SUBJECT: Skill Qualifications for Cooks

Commandant  
US Army Quartermaster School  
ATTN: ATSM-DT-SF  
Fort Lee, Virginia 23801

1. An evaluation of the Ingredient Preparation Activity (IPA), formerly a branch of the Central Food Preparation System (CFPF) at Fort Lee, VA, is being conducted by this Agency. The purpose is to evaluate the economic viability of this activity and ability to provide high quality food service to soldiers, in order to determine whether the concept should be recommended to MACOMS as a command option.
2. An area of concern related to having an Ingredient Preparation facility at an installation is the impact on cooks' skills in the dining facilities because of central processing of salad ingredients, gelatin salads, and some meat items. A list of food items processed by the IPA is at Incl 1. Request a review of the impact of Central Ingredient Preparation activities on the qualifications of a cook be furnished this Agency to consider in its evaluation.
3. The requested information is desired by 15 June 1979. The Point of Contact for this Agency is Julia H. Brown, Ext. 1153/2638.

FOR THE COMMANDER:

1 Incl  
as

*David D. Cline*  
DAVID D. CLINE  
CPT, AGC  
Adjutant



DEPARTMENT OF THE ARMY  
U.S. ARMY TROOP SUPPORT AGENCY  
FORT LEE, VIRGINIA 22001

LIST OF INGREDIENT PREPARATION ACTIVITY PRODUCTS

Sauces

Seafood Cocktail  
Chili Mustard  
Tartar

Potatoes

Shredded  
Diced  
Peeled  
Sliced

Shredded Salad Ingredients

Peppers, Green  
Carrots  
Cabbage  
Celery  
Lettuce

Chopped Salad Ingredients

Cabbage

Diced Salad Ingredients

Peppers, Green  
Carrots  
Celery  
Onions

Marinated Salad

Three Bean

Bread Crumbs



Gelatin Salads

Cherry Jello  
Peach Jello  
Cranberry and Pineapple  
Jellied Pear  
Jellied Fruit Cocktail  
Melba Mold  
Orange and Pineapple  
Pineapple and Pear  
Strawberry and Pineapple

Meat and Cheese Items

Diced Cheddar Cheese  
Sliced Bologna  
Diced Ham  
Sliced Ham  
Sliced Bacon  
Meatballs  
Salisbury Steak  
Meat Loaf



11 July 1979

## MEMORANDUM FOR RECORD

SUBJECT: Cook Skills

1. The following is a list of recipe or items prepared by Dining Facility cooks, even though IPA prepared items would be received:

a. Knife Skills:(1) Vegetables

Creamed Carrots, Q-16	Carrots, fresh, cut in 2 inch strips
Lyonnaise Carrots, Q-17	Carrots, fresh, cut in 1-1/2 inch strips
F.F. Eggplant, Q-28	Eggplant, fresh, peeled, sliced 1/3 to 1/2 inch slices
Creamed Onions, Q-33	Onions, dry, 1/2 inch slices
Baked Onions W/	Onions, dry, quartered
Tomatoes, Q-34	
F.F. Onion Rings, Q-35	Onions, dry, cut into slices 1/2 inch thick
Oven Browned	Potatoes, white, fresh, cut in wedges 1-1/2 by 1-1/2 by 1 inch
Potatoes, Q-50	Potatoes, white, fresh, cut in wedges 1-1/2 by 1-1/2 by 1 inch
Rissolle Potatoes, Q-52	Squash, fresh, summer, sliced
Fried Summer Squash, Q-63	Squash, summer, sliced or diced
Louisiana Style Smothered	
Squash, Q-64	
F.F. Tomatoes, Q-71	Tomatoes, fresh, green or half ripe, 1/2 inch slices
Parsley Buttered	Potatoes, white, fresh, cut in 1-1/2 inch pieces
Potatoes, Q-77	

(2) Salads(a) Relish trays or salad bars

Carrots, fresh strips, 4 by 1/2 inch  
Celery, fresh sticks or strips, 1/2 inch  
Cucumbers, fresh, pared, sliced  
Onions, dry, sliced  
Peppers, sweet, fresh, strips  
Tomatoes, quartered or sliced

(b) Banana Salad, M-2 - Bananas, fresh, peeled, sliced in half crosswise.



DALO-TAE-D  
SUBJECT: Cook Skills

11 July 1979

- (c) Sliced Cucumber and Onion Salad, M-15 - Cucumbers sliced 1/8 inch,  
Onions sliced 1/8 inch.
- (d) Cucumber and Sour Cream Salad, M-16 - Cucumbers, sliced.
- (e) Potato Salad, M-40 - Potatoes, white, fresh, quartered.
- (f) Tossed Lettuce, Cucumber and Tomato Salad, M-46 - Onions sliced 1/4 inch  
Cucumbers - 1/8 inch  
Tomatoes - wedges.

b. Meats:

- (1) Baked Chicken and Noodles, L-126 - Chicken cooked, cut into 1 inch pieces.
- (2) Chicken A La King, L-129 - Chicken cooked, cut into 1 inch pieces.
- (3) Chicken Pot Pie, L-132 - Chicken cooked, cut into 1 inch pieces.
- (4) Chicken Salad, L-133 - Chicken cooked, cut into 1/2 to 1 inch pieces.
- (5) Roast Turkey, L-142 - Sliced
- (6) Roast Beef Hash, L-145 - Beef cooked, cut into 3/4 inch cubes.
- (7) Sauer Braten, L-149 - Beef, thinly sliced.
- (8) Chicken Chow Mein, L-150 - Chicken cooked, cut into 1 inch pieces.

2. In addition to the above, all tomatoes and cucumbers are handled in Dining Facility.

*Richard L. Helmer*  
RICHARD L. HELMER  
Food Technologist



ANNEX H  
WORK SAMPLING DATA COLLECTION



## ANNEX H

### WORK SAMPLING DATA COLLECTION

1. During 1978, evaluation of labor requirements for operating the CFPS was accomplished at Fort Lee by assessing personnel utilization, manpower and staffing in the dining facilities, CFPF, IPA, and TISA. The specific objectives were to measure personnel performance; derive estimates of manpower requirements; determine the variations in workload for the different jobs; establish the work content of each job for defining skill levels and training requirements; and provide input to the economic analysis.

2. The approach to accomplishing these objectives was based on work sampling procedures. The data collected was reduced and analyzed by NARADCOM. Following is discussion of the description and results of work sampling data related to the Ingredient Preparation Activity as collected during July 1978:

#### a. Conduct of the Evaluation:

(1) The central food preparation activity included both the Central Kitchen (CK) and the Ingredient Preparation Activity (IPA). These two areas were work sampled simultaneously over a two week period (ten working days). The normally scheduled work day in the CFPF was from 0600-1700 hours with the work force operating on three staggered shifts. In the IPA, the scheduled work day was from 0530-1400 hours daily.

(2) Data collection procedures were essentially identical to those employed in the satellite dining facilities excepting that worker and task category were defined slightly differently to conform to the different functions and activities as shown in Table 1.

#### b. Results and Observations:

(1) Operations in the IPA differed from those at the Central Kitchen as shown in the workload distribution in Table 2. The main function of this activity was the preparation and packaging of raw ingredients including shredding, packing, and weighing of vegetables and fruits for the satellite dining facilities to use in salad and meal preparation and for CFPF production. As in the CFPF, most of the effort was in food preparation, portioning and packaging, and sanitation. Since little cooking is required, the greatest emphasis was on portioning and packaging operations. Non-productive time (19%) was lower than for the dining facilities or Central Kitchen.



(2) The military supervisor spent most of his time in administration and supervision (53%) but a relatively high percentage of time was non-productive. NARADCOM noted that during the two weeks of work sampling in the IPA, the military supervisor was available for only half of the time, thus these data may not provide an accurate profile of normal operations. Much of the administrative work was performed by military cooks since no specific position was provided for this purpose.

(3) NARADCOM stated that there was no reason to conclude that the operation of the IPA is inadequate or inefficient and no obvious discrepancies were noted. The IPA (along with the TISA) showed a lower level of non-productive manhours than dining facilities or the CFPF, even less than the proposed standard of 21%. The fact that the IPA had operated for three years and was more stable and manageable than the other parts of the CFPS was cited for this. NARADCOM also reported that the staffing of the Ingredient Preparation area was adequate and efficient.



AD-A078 943

ARMY TROOP SUPPORT AGENCY FORT LEE VA DIRECTORATE OF--ETC F/G 6/8  
INGREDIENT PREPARATION ACTIVITY.(U)

SEP 79

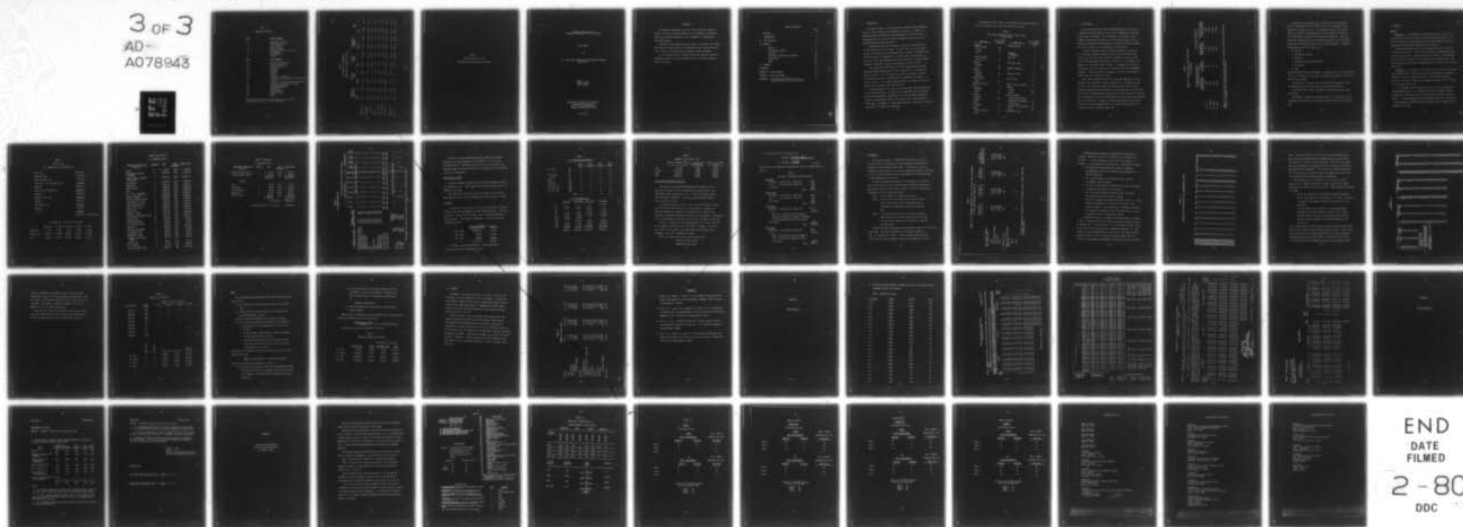
UNCLASSIFIED

CS-SD-7903

NL

3 OF 3

AD-A078943



END  
DATE  
FILMED

2-80  
DDC



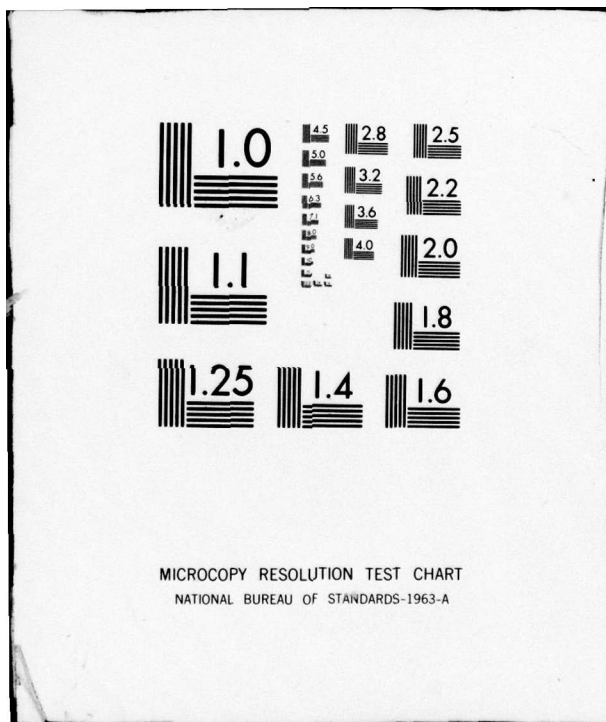




TABLE I

## WORKER/TASK CATEGORY

<u>CODE</u>	<u>WORKER CATEGORY</u>
1	Supervisor, Military
2	Supervisor, Civilian
3	Cook, Military
4	Cook, Civilian
5	Baker, Civilian
6	Food Service Worker, Civilian
7	Warehouseman
8	Administrative
9	Janitors
<u>CODE</u>	<u>TASK CATEGORY</u>
11	Ingredient Preparation
12	Entree Preparation
13	Dessert Preparation
21	Portioning
22	Packaging
23	Freezing
24	Packing
25	Storing
31	Sanitation, Equipment
32	Sanitation, Entree/Ingredient Preparation Spaces
33	Sanitation, Dessert Preparation Spaces
34	Sanitation, Storage/Other Spaces
41	Inventory/Maintenance
42	Shipping/Receiving
50	Supervision
60	Administrative
71	Scheduled Breaks
72	Absent
73	Idle

Detailed definitions of the task categories are included in Appendix C to Annex B of the CFPS Report.



TABLE 2  
DISTRIBUTION OF WORKLOAD  
INGREDIENT PREPARATION ACTIVITY

	MILITARY SUPERVISOR		MILITARY COOKS		CIVILIAN COOKS		FOOD SERVICE WORKERS		TOTAL	
	M-HR	%	M-HR	%	M-HR	%	M-HR	%	M-HR	%
Food Preparation	1.96	9.33	24.14	16.52	17.47	21.67	42.49	25.06	86.06	20.61
Portioning-Packaging	0.40	1.92	34.00	23.27	20.67	25.63	39.40	23.24	94.47	22.63
Cooking	1.07	5.09	19.02	13.02	17.44	21.64	49.43	29.16	87.01	20.84
Supply	0.86	4.10	8.26	5.66	1.96	2.43	2.53	1.49	13.61	3.26
Supervision	4.46	21.23	6.24	4.27	2.79	3.46	1.13	0.66	14.65	3.51
Administration	6.72	32.01	27.50	18.82	5.65	7.01	2.81	1.66	40.55	9.71
Productive	15.47	73.68	116.9	80.02	65.99	81.84	137.78	81.28	336.36	80.57
Non-Productive	5.53	26.32	29.19	19.98	14.64	18.16	31.74	18.72	81.14	19.43
Total	21.00	100.00	146.11	100	80.63	100.00	169.51	100.00	417.50	100.0



ANNEX I

ECONOMIC ANALYSIS OF THE

INGREDIENT PREPARATION ACTIVITY CONCEPT



ECONOMIC ANALYSIS OF THE  
INGREDIENT PREPARATION FACILITY CONCEPT

FINAL REPORT

for

U.S. ARMY NATICK RESEARCH AND DEVELOPMENT COMMAND  
OR/SA OFFICE

Robert D. Davis  
Raman Joneja  
Rob R. Weitz

Department of Industrial Engineering  
and Operations Research  
University of Massachusetts  
Amherst, Massachusetts 01003

June 1979



## ABSTRACT

An ingredient preparation facility in which some food items are totally or partially prepared centrally and distributed to consumption centers for further processing or final consumption is analyzed for cost-effectiveness.

The analysis uses comparative costs based on the annual cost method. The analysis is based primarily on experience at Fort Lee since January 1978. Costs are extrapolated over a range of feeding strengths.

It is concluded, based on existing conditions, that the ingredient preparation system is not cost effective within the feeding strengths used in the study.



## TABLE OF CONTENTS

	Page
ABSTRACT	i
I INTRODUCTION	1
II COST ANALYSIS	3
III MODULES	6
Capital	6
IPF Related Staffing	11
Supplies	11
Utilities, Maintenance and Repair	13
DF Staffing	15
Food	23
IV SUMMARY	25
REFERENCES	27
APPENDIX A Wage Schedules	28
APPENDIX B Area Requirements	34
APPENDIX C DF Staffing Requirements, Activity Classifications, and DF Service Levels	37



## I. INTRODUCTION

In an earlier study, it was found that the central food preparation facility (CFPF) concept was not economically viable [1]. However, no attempt was made to evaluate isolated components of the CFPF system. At the request of TSA, this report covers an economic analysis of an in-<sup>g</sup>redient preparation facility (IPF).

A comparative cost analysis between a food service system with an IPF and one without an IPF is used. The IPF at Fort Lee is the source of most of the data used in the present study. However, information from the CFPF analysis [1], especially for Forts Carson, Lewis and Knox, is also used. Also, data collected for another study [2] are used to obtain estimates of potential savings in dining facility (DF) staffing.

In a system with an IPF some of the food items obtained from the Troop Issue Subsistence Activity (TISA) are partially or totally prepared in the IPF. A list of items that would be processed in the IPF for a given 42 day menu, along with their frequency of occurrence, is given in Table 1. In a system without the IPF, all phases of food preparation are conducted in the individual DFs.

The IPF assumed in this study is to be obtained through modifications of an existing building. Since we are not considering new construction and since the equipment requirements for an IPF are modest compared to a CFPF, the system under study is much less capital intensive than a CFPF system. Consequently, rather modest savings in personnel, if possible, could result in overall cost reductions.



The objective of this study is to determine the economic viability of this IPF concept over a wide range of facility sizes.

TABLE 1  
FOOD ITEMS PROCESSED IN AN IPF FOR A GIVEN  
42 DAY MENU

<u>Food Item</u>	<u>No. of Times On Menu</u>	<u>Food Item</u>	<u>No. of Times On Menu</u>
Potatoes:		Panned Sausage	10
Whole, peeled	23		
Sliced	20	Meatballs	3
Diced	8	(Spaghetti)	
Whole, Baking	7	Meat Loaf	4
French Fries	51		
Carrots:		Salisbury Steak	4
Shredded	23		
Diced	24	Swedish Meatballs	2
Cabbage:			
Shredded	29	Bologna, Sliced	4
Chopped	11		
Green Peppers:		Ham, Sliced	16
Diced	50		
Hamburger Patties	42	Bacon, Sliced & Panned	41
Celery:		Cheese:	
Shredded	5	Sliced	40
Diced	64	Diced	18
Lettuce:		Gelatin Salads:	
Chopped	42	Jellied Spice Cherry	1
Wedges	6	Cranberry & Pineapple	2
Onions:		Jellied Pear	2
Chopped	56	Jellied Fruit Cocktail	4
Sauces:		Other	14
Seafood Cocktail	8	Three Bean Salad	1
Tartar	9		



## II. COST ANALYSIS

As in the CFPF analysis [1], the procedure used in this study is a comparative economic analysis that utilizes incremental costs based on the annual cost method. The differences in total annual costs between a conventional system and an IPF system providing service in the same environments are determined as a function of system parameters and provide the basis for the comparative cost analysis.

In order to examine potential economies of scale, the same four U.S. Army posts selected as potential sites for a CFPF--Forts Lee, Carson, Lewis and Knox--were selected as potential sites for an IPF. The relative magnitude of operations at each IPF is illustrated by the number of IPF servings listed in Table 2. An average of five (5) IP servings per ration is assumed (per discussions with TSA and NARADCOM personnel). The base period for headcounts for each of these posts is CY1977 (same as in the CFPF analysis).

Labor costs are based on the GS, Military and Wage Board (by geographical area) schedules included in Appendix A. The operating costs of the IPF are based on the data collected at the Ft. Lee IP area (to the extent possible) and extrapolated to the appropriately sized facility. Labor costs are determined per above schedules with increases for insurance and all benefits of 18.1% for GS employees and 39% for wage board employees (per CITA guidelines). Savings in food costs are based upon IP issues during April through September 1978. All costs have been updated to 1979 costs using an inflation rate of 6%.



TABLE 2

SUMMARY OF ANNUAL RATIONS, PARTICIPATION AND  
IPF SERVINGS

	Data Obtained from DA Form 2969 for Base Period		IPF System Information*	
	Total Rations (1,000 Rations)	Percent Participation	Total Rations (1,000 Rations)	Total IPF Servings (1,000 Servings)
Ft. Lee	905	64	775	3,874
Ft. Carson	1,344	43	1,337	6,683
Ft. Lewis	2,077	51	2,023	10,116
Ft. Knox	3,288	76	2,873	14,364

\*Number of IPF rations were obtained from DA Form 2969 by excluding National Guard and Reserve rations; see Appendix D of [1] for additional details.



A food service system may be partitioned into a set of modules that are interrelated in a functional way but are independent of one another with respect to costs. This approach is used in the current analysis so that only those modules that have different costs for an IPF system versus a conventional system can be identified. Then, the differences between costs of the alternative system may be obtained by summing the differences in costs of the individual modules. The resulting modules used in this analysis are:

- o Capital
- o IPF related staffing
- o Supplies
- o Utilities, Maintenance and Repair
- o DF staffing
- o Food

The transportation module considered in [1] does not exist in this analysis since it is assumed that the current issue/delivery schedule to DFs will be used for both systems.

Each module is discussed in the next section with respect to both the assumptions and the data sources used to derive their cost.

Table 12 displays clearly the impact that each module has on the system cost.

The reader is referred to the CFPF analysis [1] for details on the procedure, the selection of the potential sites for an IPF, and the data base.



### III. MODULES

#### CAPITAL:

Buildings: It is assumed that the building used for an IPF will be converted for such use from an existing building on each base. The cost of conversion is extrapolated from Fort Lee estimates and is considered to be proportional to the area of the facility.

The estimated conversion cost at Fort Lee was \$74,834 in 1972 for a building of 4,916 ft.<sup>2</sup>. This cost was adjusted to current values using an inflation rate of 6%. Details are given in Table 3A. The estimated areas of the IPFs required at the four bases were provided by TSA. The capital recovery cost assumes an economic life of 25 years and an interest rate of 10%.

Equipment: An equipment list for the Fort Lee IP by year of purchase was provided by TSA. The cost of each piece of equipment is updated to 1979 costs using an inflation rate of 6%. Details are provided in Table 3B. The capital recovery cost assumes an economic life of 10 years and an interest rate of 10%.

It is assumed that DFs served by an IPF will not be provided with some equipment required in a conventional system. A summary of such equipment was provided by TSA as a function of the DFs and is given in Table 3C. Costs are updated using an inflation rate of 6%. The savings in DF equipment are amortized using an economic life of 10 years and an interest rate of 10%.



TABLE 3

## CAPITAL COSTS

## A. RENOVATIONS OF BUILDINGS FOR IP

Labor Cost	\$24,120.00
Materials Cost	24,120.00
Labor benefits, 18%	4,341.60
Sales tax: 4% of materials cost	<u>964.80</u>
Subtotal	53,546.40
Construction Overhead, 10%	<u>5,354.64</u>
Subtotal	58,901.04
Company Profit, 10%	<u>5,890.10</u>
Subtotal	64,791.14
Contingency, 10%	<u>6,479.11</u>
Subtotal	71,270.26
S & A, 5%	<u>3,563.51</u>
	\$74,833.77 at 1972 prices

At 1979 prices, 6% inflation: \$112,522

	Base Rate	Ft. Lee	Ft. Carson	Ft. Lewis	Ft. Knox
Area (ft <sup>2</sup> )	4,916	4,500	4,500	4,900	5,200
Capital Cost	112,522	103,000	103,000	112,156	119,022
CRC	12,397	11,348	11,348	12,356	13,113



TABLE 3 (Continued)

## B. EQUIPMENT FOR IP

INGREDIENT PREPARATION ACTIVITY	QUANTITY	COST	YEAR ACQUIRED	UPDATED COST
Scales	2	\$ 410.00	1972	\$ 616.49
Food Washer & Waste Disposer	1	1,647.00	1972	2,476.48
Potato Peeler, Conveyor & Lye Tank	1	9,515.00	1973	13,497.21
Ice Machine	1	1,135.00	1973	1,610.02
Centrifuge	1	1,747.00	1973	2,478.15
Table w/Scale	1	869.00	1972	1,306.65
Sink	3	4,584.00	1972	6,892.64
Mill Dicer, Vegetable	1	3,210.00	1973	4,553.45
Dicer, Vegetable	1	18,000.000	1978	19,080.00
Vertical Cutter & Mixer	1	1,895.00	1973	2,688.09
Steam Kettle, 40 gal.	1	1,108.50	1976	1,320.24
Table w/Meat Slicer	1	1,730.00	1974	2,315.13
Meat Slicer-Floor	2	5,336.00	1972	8,023.37
Meat Mixer	1	1,506.00	1976	1,793.67
Meatball Former	1	1,430.00	1973	2,028.48
Meat Molding Machine w/Conv.	1	7,471.00	1973	10,597.76
Wire Baskets	32	1,360.00	1972	2,044.94
Storage Cabinets	1	663.00	1973	940.48
Pan & Storage Racks	6	703.50	1977	790.45
Hand Sink	1	1,000.00	1972	1,503.63
Label Printing Mach	1	550.00	1977	617.98
Can Opener, Elec.	3	246.00	1977	276.41
Vegetable Trimmer	1	360.00	1977	404.50
Cleaner, Spray, Auto, Water	3	390.00	1974	521.91
Hand Trucks	3	654.00	1973	927.71
Air Curtains	2	711.76	1973	1,009.65
Stainless Steel Table	2	1,326.00	1974	1,774.49



TABLE 3 (Continued)

## B. EQUIPMENT FOR IP

INGREDIENT PREPARATION ACTIVITY	QUANTITY	COST	YEAR ACQUIRED	UPDATED COST
Stainless Steel Table	2	\$ 500.00	1974	\$ 669.11
Stainless Steel Table	1	<u>297.00</u>	1974	<u>397.45</u>
		\$70,354.76		\$93,156.54
OFFICE				
Desk	1	86.00	1973	121.99
Calculator	1	607.00	1973	861.04
Filing Cabinet	1	85.00	1973	120.57
Typewriter	1	441.00	1973	625.57
Water Fountain	1	<u>199.00</u>	1973	<u>282.29</u>
		\$ 1,418.00		\$ 2,011.46
		Grand Total		\$95,168.00
		Capital Recovery, 10%, 10 years:		\$15,488.59



TABLE 3

## C. DF EQUIPMENT REDUCTION

## DF Design Capacity or DF Classification\*

Equipment Description	Equipment Classification	Cost \$ (1978)	New Construction							Modernization				
			Number of Pieces of Equipment Saved							Type 64 (245)	Type 64A (245)	Type 121 (300)	Type 106 (800)	
			40-80	81-150	151-250	251-400	401-650	651-1000	1001-1500	1501-2000				
Vegetable Cutting & Slicing	K-46-1	1589	1	1	1	1	0	0	0	0	0	0	0	0
Vegetable Cutting & Slicing	K-47-1	2292	0	0	0	0	1	1	2	2	1	1	1	1
Vegetable Peeling	K-48-1	919	0	0	0	0	0	0	0	0	1	1	1	0
Vegetable Peeling	K-48-2	851	0	0	0	0	0	0	0	0	0	0	0	1
Sink	K-40-1	1080	1	1	1	1	1	1	1	1	0	0	1	0
Sink	K-40-2	1296	0	0	0	0	0	0	0	0	1	1	0	1
Meat Slicing	K-24-1	955	0	0	0	0	0	0	1	1	2	0	0	1
Table	K-44-1	1296	0	0	0	0	0	0	1	1	1	0	0	0
Vegetable Peeling	K-49-1	1732	1	1	1	1	0	0	0	0	0	0	0	0
Vegetable Peeling	K-49-2	1995	0	0	0	0	0	1	1	1	0	0	0	0
Net Savings (1978 \$)			4401	4401	4401	4401	5367	7618	9910	10865	4507	4507	4291	5394
Net Savings (1979 \$)			4665	4665	4665	4665	5689	8075	10505	11517	4777	4777	4548	5718

## Equipment Savings

## Number of DFs of above Classification

																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	----

\*Non-standard facilities are included under "New Construction" listing by design capacity



The DFs at the four bases that would be affected by equipment reductions are those assumed to be in operation in [1] during the 1977 base period. A description of the DF (by type or capacity) was obtained during visits to the bases, with some additional clarification provided by TSA personnel.

#### IPF RELATED STAFFING:

The annual expense charged for each worker was computed according to the methods in [1]. Here, however, more current salary scales (see Appendix A) are used.

The number of IP workers for Forts Lee, Carson, Lewis and Knox were supplied by TSA. Staffing details and costs are given in Table 4.

#### SUPPLIES:

Supply costs in the IP area at Fort Lee for the months of November 1978, December 1978 and January 1979 were obtained from TSA. Utilizing the total rations and total IP supply costs for these three months, a supply cost per ration figure is determined. Total IPF rations are summarized in Table 2.

	Ft. Lee	
	<u>IPF Supply Costs</u>	<u>Rations</u>
Nov. 1978	\$2,026.96	77,481
Dec. 1978	786.29	48,005
Jan. 1979	<u>891.60</u>	<u>62,704</u>
	\$3,704.85	188,190

IPF supply cost/ration=\$3,704.85/188,190=\$.01969/ration

Annual supply costs are summarized in Table 3.



TABLE 4

I. P. STAFFING REQUIREMENTS

		<u>Fort Lee</u>	<u>Fort Carson</u>	<u>Fort Lewis</u>	<u>Fort Knox</u>
Fd. Supv.	E8	0	0	0	1
	E7	1	1	1	0
First Cook	E6	0	0	1	1
Sr. Cook	E5	1	1	1	1
Cook	E4	1	1	1	2
Cook PPT	WG5	1	1	0	0
Fd. Wrk. Ldr.	WL5	0	1	1	1
Fd. Svc. Wkr.	WG3	1	1	1	2
Fd. Svc. Wkr.	WG2	<u>1</u>	<u>1</u>	<u>2</u>	<u>2</u>
Totals		6	7	8	10

I. P. STAFFING COSTS

	<u>Fort Lee</u>	<u>Fort Carson</u>	<u>Fort Lewis</u>	<u>Fort Knox</u>
E8	\$ 0	\$ 0	\$ 0	\$ 18,516
E7	15,810	15,810	15,810	0
E6	0	0	13,161	13,161
E5	11,078	11,078	11,078	11,078
E4	9,298	9,298	9,298	2(9,298)
WG5	18,099	18,590	0	0
WL5	0	20,441	24,460	20,874
WG3	15,988	17,376	20,701	2(17,405)
WG2	<u>14,919</u>	<u>16,769</u>	<u>2(19,949)</u>	<u>2(16,624)</u>
	\$85,192	\$109,362	\$134,406	\$150,283



TABLE 5

## SUMMARY OF IPF SUPPLY COSTS

	TOTAL IPF ANNUAL RATIONS	$\times$ I.P. SUPPLY COST PER RATION	= ANNUAL I.P. SUPPLY COSTS
Lee	774,769	.01969	15,255
Carson	1,336,674	.01969	26,319
Lewis	2,023,219	.01969	39,837
Knox	2,872,828	.01969	56,566

UTILITIES, MAINTENANCE AND REPAIR:

The same cost distribution methodology and formulae of [1] are used here to assign utility and maintenance and repair costs. Area requirements were provided by Lt. Col. J. Turner, MFR dated 15 March 1979 (included as Appendix B). Utility and maintenance and repair costs are given in Table 6.

In a recent study by Hu, et al, [3], a cost of utilities of \$0.001 per IP serving was determined for Ft. Lee operations. However, the trade-off between the consumption of energy required in the IPF and the energy requirements removed from the DFs was not addressed. Consequently, utility costs based on the results of [3] are not included in this report.

Since it is assumed that the same equipment will be used in the IPs for all bases, a uniform cost for M & R parts is assumed. The cost of M & R parts is considered to be proportional to the expenditure for equipment. This cost is computed as follows:

Total M & R parts costs at Fort Lee for entire CFPF:

\$41,405 (at 1978 prices)

= \$43,889 at 1979 prices



M & R parts cost for IP function only:

$$\begin{aligned} & \$43,889 \times \frac{\text{IP equip. cost}}{\text{Total CFPF equipment cost}} \\ & = \$43,889 \times \frac{95,168}{3,762,046} = \$1,110 \end{aligned}$$

Total cost for utilities and maintenance and repair are summarized in Table 6.

TABLE 6

## UTILITIES, MAINTENANCE AND REPAIR COSTS

Fort Lee

Utilities:	(\$0.62/ft <sup>2</sup> -yr) (4500 ft <sup>2</sup> )	\$2790
M & R:	(\$0.76/ft <sup>2</sup> -yr) (4500 ft <sup>2</sup> )	3420
M & R Parts		<u>1110</u>
Total		\$7320

Fort Carson

Utilities:	(\$0.54/ft <sup>2</sup> -yr) (4500 ft <sup>2</sup> )	\$2430
M & R:	(\$0.44/ft <sup>2</sup> -yr) (4500 ft <sup>2</sup> )	1980
M & R Parts		<u>1110</u>
Total		\$5520

Fort Lewis

Utilities:	(\$0.35/ft <sup>2</sup> -yr) (4900 ft <sup>2</sup> )	\$1715
M & R:		1660.80
Admin.-	(\$0.142/ft <sup>2</sup> -yr)(700 ft <sup>2</sup> )=\$99.40	
TISA Cold-	(\$0.439/ft <sup>2</sup> -yr)(3400 ft <sup>2</sup> )=\$1492.6	
TISA Dry-	(\$0.086/ft <sup>2</sup> -yr)(800 ft <sup>2</sup> )=\$68.80	
M & R Parts		<u>1110</u>
Total		\$4485.80

Fort Knox

Utilities:	(\$0.395/ft <sup>2</sup> -yr)(5200 ft <sup>2</sup> )	\$2054
M & R:		2513.70
Admin.	(\$0.981/ft <sup>2</sup> -yr)(700 ft <sup>2</sup> )=\$686.70	
TISA:	(\$0.406/ft <sup>2</sup> -yr)(4500 ft <sup>2</sup> )=\$1827	
M & R Parts		<u>1110</u>
Total		\$5677.7



### DF STAFFING

Although work content is transferred from individual DFs to an IPF, the savings in DF personnel are not necessarily proportional to the amount of work removed from the DFs. The savings, if any, are influenced by many factors; e.g., specific employee schedules, flexibility of time in which IP operations can be performed and the relative amount of non-productive time in the DFs.

In order to estimate the savings in DF personnel, work sampling data from an earlier study [2] were analyzed to determine work force requirements (wfr) for each of the four DFs in which work sampling was conducted for the following three cases:

CASE 1: wfr to perform all productive activities;

CASE 2: wfr to perform the productive activities remaining after eliminating all activities categorized as preparation of vegetables, salads and sandwiches; and,

CASE 3: wfr to perform the productive activities remaining after eliminating the three categories of CASE 2 and all activities categorized as preparation of dessert, soup and meats.

Optimal DF staffing schedules were developed for each DF for each of the three cases. The resulting savings in DF personnel compared to CASE 1 are summarized in Table 7. Some of the pertinent parameters of the DFs and the work sampling study are also summarized in Table 7.



TABLE 7

SAVINGS IN DF PERSONNEL (COMPARED TO CASE 1) FOR THE FOUR DFs COVERED  
BY THE WORK SAMPLING STUDY OF [2]

No. of Work Sampling Observations for*:	Bldg. #694 Ft. Devens, MA		Bldg. #649 Ft. Devens, MA		Pease Main Pease AFB, NH		Ney Hall USN Educational & Research Ctr., RI	
Cooks	19,452		20,836		11,702		15,838	
Food Service Workers	14,951		13,940		9,692		36,284	
Supervisor	3,473		5,131		3,229		5,923	
Total	37,876		39,907		24,623		58,045	16
Rations per day	257		330		347		833	
Number of DF Personnel Saved for:								
CASE 2	0		1		0		1	
CASE 3	0		2		0		4	

\*The work sampling was conducted for 14 contiguous days at each of the four military posts.



Although no definite pattern of reduction in DF personnel is evident, a reduction in staff is indicated in two of the four DFs of Table 7. In order to obtain an upper bound on DF savings in personnel, a rough estimate of these savings is formalized as follows:

1. DF staffing for the conventional system is assumed to be determined by Table 8 (a staffing table developed for the CFPF study [1]).
2. For a DF serving up to 223 rations per day, no saving is assumed in the IPF system.
3. For a DF serving from 224 to 624 rations per day, one worker is assumed to be saved in the IPF system.
4. For a DF serving above 624 rations per day, two workers are assumed to be saved in the IPF system.
5. The workers excessed are assumed to be WG5's and E4's. If two workers are excessed for a given DF, one worker of each grade is assumed. If only one worker is excessed, the grade of the worker corresponds to the last grade (WG5 or E4) that was added to the staff according to Table 8.

DF staffing by Table 8 is assumed for the same reasons as covered in [1]: "In general there are at least three different staffing levels to consider for a given military DF: (1) the number of people required to run the DF in a strictly garrison feeding environment; (2) the number of authorized personnel for a DF; and (3) the actual number of people assigned to the DF. Insuring that good customer service is provided is the primary consideration in determining the first staffing



TABLE 8  
PROPOSED DF STAFFING TABLE FOR A CONVENTIONAL SYSTEM

RATIONS	E9	E7	E6	E5	E4	E3	UL8	UG8	UG6	UG3 TOTAL	UL1	UG1 TOTAL	PERSONNEL
0-120	0	1	1	2	1	1	1	0	0	1	1	5	14
121-145	0	1	1	2	1	1	1	0	0	1	1	5	14
146-170	0	1	1	3	1	1	1	0	0	1	1	6	17
171-197	0	1	1	3	1	1	1	1	0	1	1	8	20
198-223	0	1	1	3	1	1	1	1	1	1	1	8	21
224-251	0	1	1	3	1	1	1	1	1	1	1	9	23
252-279	0	1	1	3	1	1	1	1	1	2	1	10	25
280-307	0	1	1	3	1	1	1	2	2	2	1	11	27
308-336	0	1	1	3	1	1	1	2	2	2	1	12	29
337-365	0	1	1	3	1	1	1	2	3	3	1	13	31
366-395	0	1	1	3	1	1	1	2	3	3	1	14	33
396-422	0	1	1	3	1	1	1	2	3	3	1	15	35
423-457	0	1	1	3	1	1	1	2	3	3	1	16	37
458-489	0	1	1	3	1	1	1	2	3	3	1	16	38
490-522	0	1	1	4	1	1	1	3	3	3	1	17	40
523-556	0	1	1	4	1	1	1	3	3	3	1	18	42
557-590	0	1	1	4	1	1	1	3	3	3	1	19	44
591-624	0	1	1	4	1	1	1	3	4	4	1	20	46
625-659	0	1	1	4	1	1	1	3	4	4	1	22	49
660-695	0	1	1	4	1	1	1	4	4	4	1	23	51
696-731	1	1	1	4	1	1	1	4	4	4	1	24	53
732-767	1	1	1	4	1	1	1	4	4	4	1	25	55
768-805	1	1	1	4	1	1	1	4	4	4	1	26	57
806-843	1	1	1	5	1	1	1	4	4	4	1	27	58
844-881	1	1	1	5	1	1	1	4	4	4	1	27	60
882-921	1	1	1	5	1	1	1	4	4	4	1	29	63



level. The second staffing level must provide good customer service but it must also consider other requirements peculiar to the DF and the troops that it serves--such as readiness. The third level assumes that the requirements of the second exist but are modified according to the availability of personnel." The reduction in staff must come from the first staffing level since the other requirements that are covered by the second and third staffing levels are unchanged.

The DFs assumed to be in operation for this analysis are the same as in [1]. They are identified in Table 9 which also provides the average IPF rations per day for each DF. These figures are determined as follows:

1. For Ft. Lee, the total IPF rations per day were allocated to DFs in direct proportion to the capacity of the DF. Allocation of rations in this manner correlates very well with Ft. Lee experience.
2. For Forts Carson, Lewis and Knox, a correlation between DF capacity and rations served in the DF was not evident. Average IPF rations per day for these posts were allocated to DFs in direct proportion to the rations served per day during CY77.

In all cases total IPF rations per day were obtained from DA Forms 2969 for CY77 by excluding National Guard and Reserve rations. These rations were excluded since the Guard and Reserve units provide supplementary DF personnel when they receive rations. The rations per day served in DFs during FY77 at Forts Carson, Lewis and Knox were obtained from



TABLE 9  
RATIONS PER DAY BY DF

Ft. Lee			Ft. Carson			Ft. Lewis			Ft. Knox		
DF	Capacity	IPF Rations Per Day	DF	Avg. Rations/Day CV772	Avg. Rations/Day IPF3	DF	Avg. Rations/Day CV772	Avg. Rations/Day IPF3	DF	Avg. Rations/Day CV772	Avg. Rations/Day IPF3
P-8400	771	447	3565	69	69	1452	137	142	6872	91	80
P-8402	771	447	8010	42	42	2006A	304	315	6878	118	104
P-3701	491	285	12001	55	55	5810	99	102	6818	131	115
P-3108	425	247	1040	237	236	8810	83	86	6723	112	99
P-3024	300	174	1041	179	178	9834	83	86	6719	121	106
P-3118	300	174	1361	218	217	3740	179	185	6682	120	106
P-9304	300	174	1369	175	174	3114	164	170	6674	118	104
T-2012	300	174	1669	276	275	20270	126	130	6550	109	96
Totals	3658	2122	1661	125	124	6A38	121	125	6557	111	98
1. 90 minute serving period			1661	125	124	4E1	70	72	6556	103	91
2. From informal worksheets at each base			811	131	130	5E23	70	72	6555	103	91
3. Total IPF rations from DA Forms 2969 for CV77 with Nat. Guard & Reserve rations omitted; DF entries obtained from			1012	125	124	7E1	108	112	6554	54	48
Total IPF rations/day (CV77 DF ration/day)			1218	108	107	8E23	108	112	6552	123	108
Total CV77 rations/day			1219	71	71	9E1	99	102	6551	117	103
			1117	152	151	1270	48	50	6546	115	101
			8452	81	81	2026C	200	207	6547	99	87
			8823	73	73	6141	102	106	6548	122	107
			8854	106	105	3657	88	91	6543	124	109
			3265	72	72	2020C	114	118	6542	125	110
			3275	113	112	3119	145	150	6578	118	104
			3465	70	70	3157	188	195	6541	120	106
			3365	52	52	3165	159	165	6580	116	102
			2061	500	497	3213	161	167	7741	35	31
			2161	592	587	3218	122	126	798	84	84
			9612	60	60	3281	145	150	7394	60	53
Totals			3662	362	362	3222	136	141	233	85	75
						3416	134	139	141	205	205
						3417	224	232	1479	141	124
						3475	165	171	1480	210	185
						3654	190	197	1486	143	126
						3655	115	119	2375	221	194
						3420	231	239	2378	162	143
						2015	171	177	2380	211	186
						Totals	325	336	2442	631	555
							108	112	5940	250	220
							5357	5545	6012	609	536
									6018	363	319
									5917	569	501
									5915	596	524
									7023	205	180
									7053	209	184
									7059	177	156
									6891	118	104
									6867	114	100
									6869	109	96
									6828	116	102
									6827	123	108
									6824	138	121
									1485	149	121
									2374	150	121
									2882	17	12
									Totals	8947	7874



unofficial worksheets of employees at each of the four bases. Consequently, they will not always agree with DA Form 2969. They are, however, sufficiently accurate to use as a basis for ration allocation. The reader is referred to Appendix B of [1] and Appendix A of [4] for additional details.

Using the IPF ration per day figures of Table 9 and the procedure for determining DF savings outlined above, the savings in DF staffing were computed; they are summarized in Table 10.



TABLE 10  
SAVINGS IN DF STAFFING

Rations/Day	Grade Saved	Number of DFs with Savings			
		Ft. Lee	Ft. Carson	Ft. Lewis	Ft. Knox
224-251	WG5	1	1	2	
252-279	WG5		1		
280-307	WG5	1			
308-336	WG5			2	1
423-457	E4	2			
490-522	E4		1		1
523-556	E4				3
557-590	WG5		1		

	#WG5 Saved	#E4 Saved	Salary WG5	Salary E4	Total DF Savings
Ft. Lee	2	2	18,099	9,298	54,794
Ft. Carson	3	1	18,590	9,298	65,068
Ft. Lewis	4	0	22,262	9,298	89,048
Ft. Knox	1	4	18,966	9,298	56,158



FOOD:

Fort Lee experience indicates that some raw food savings should accrue due to:

- (1) slicing bacon in the IPF instead of buying sliced bacon; and,
- (2) higher yields for non-meat items due to more efficient processing methods in the IPF.

Savings in these two categories are estimated as follows:

- (1) The following information was provided by TSA personnel:
  - a) Bacon appears on the 42-day menu for 41 out of the 42 days.
  - b) On the average, 0.08183 pounds of bacon are consumed for each ration served in the DFs.
  - c) The May 1979 cost per pound of sliced and unsliced bacon was \$1.33 and \$1.22 respectively which yields a savings of \$0.11 per pound.

Based upon this information the annual savings due to buying sliced bacon are given by:

$$\left(\frac{41}{42}\right)(0.11)(0.08183)(\text{No. of rations served/year})$$

The resulting savings are summarized in Table 11.

- (2) Based upon discussions with both TSA and NARADCOM personnel, a 5% savings in the cost of non-meat items processed in the IPF is assumed. TSA personnel has provided the following information:



- a) During the period, April through September 1978, the non-meat IPF issues totaled \$48,288. Therefore, the cost of these issues in a conventional system would be:

$$(\$48,288 / .95) = \$50,829.47$$

- b) During the same period, the number of rations served totaled 369,487.

Based upon this information the annual savings due to more efficient processing procedures in the IPF are given by:

$$\frac{(\$48,288 / .95) - (\$48,288)}{369,487} \text{ (No. of rations served/year)}$$

The resulting savings are summarized in Table 11.

TABLE 11

## SUMMARY OF ANNUAL FOOD SAVINGS

	<u>Rations/Year</u>	<u>Food Savings in Dollars</u>		
		<u>Bacon</u>	<u>Non-Meat Items</u>	<u>Total</u>
Ft. Lee	774,769	6,808	5,329	12,137
Ft. Carson	1,336,674	11,745	9,194	20,939
Ft. Lewis	2,023,219	17,778	13,916	31,694
Ft. Knox	2,872,828	25,243	19,760	45,003



#### IV. SUMMARY

A summary of the costs and losses is provided in Table 12. The IPF system is not cost effective in any of the cases. It should be noted that all aspects of this report are based upon operating levels for DFs and not upon design levels. Extensions to consider design levels could follow the same procedure but would require additional staffing levels for the IPF.

Supply costs are in every case greater than food savings; both supply cost and food savings vary with the number of meals served. IPF staffing costs are greater than the sum of the savings due to DF equipment and staff reductions in every case. Additional costs are also incurred in the IPF system due to IPF equipment, building, utilities, maintenance and repair. Those due to equipment and buildings are almost constant. Therefore, it does not appear that the IP system could be cost-effective within the range considered, or even in somewhat larger facilities.



TABLE 12  
SUMMARY OF ANNUAL COSTS

	Ft. Lee	Ft. Carson	Ft. Lewis	Ft. Knox
<b>Savings:</b>				
Food	12,137	20,939	31,694	45,003
SDF Staffing	54,794	65,068	89,048	56,158
SDF Equipment	<u>7,517</u>	<u>21,130</u>	<u>28,973</u>	<u>41,681</u>
Savings Subtotal	74,448	107,137	149,715	142,842
<b>Increases:</b>				
IP Equipment, CRC	15,489	15,489	15,489	15,489
Construction of IP building, CRC	11,348	11,348	12,356	13,113
Supplies	15,255	26,319	39,837	56,566
IP Staffing	85,192	109,362	134,406	150,283
M & R	3,420	1,980	1,661	2,514
M & R Parts	1,110	1,110	1,110	1,110
Utilities	<u>2,790</u>	<u>2,430</u>	<u>1,715</u>	<u>2,054</u>
Increases Subtotal	134,604	168,038	206,574	241,129
Net Losses	60,156	60,901	56,859	98,287



REFERENCES

- 1) Davis, R.D., Joneja, R., Weitz, R.R., "An Economic Evaluation of the Central Food Preparation Facility Concept", December, 1978, University of Massachusetts, Amherst.
- 2) Giglio, R.J., Davis, R.D., Grabiec, R.A., Weitz, R.R., "A Methodology to Estimate Work Force Requirements in Military Food Service Facilities", November 8, 1977, University of Massachusetts, Amherst.
- 3) Hu, K.H., et al., "Quantitative Analysis of Energy Usage in Central Food Preparation System at Fort Lee, Va.", U.S. Army Natick Research and Development Command.
- 4) Davis, R.D., Joneja, R., Weitz, R.R., "An Economic Evaluation of the Central Food Preparation Facility at Fort Lee, Virginia", October 1978, University of Massachusetts, Amherst.



# REFERENCES

- 1) Davis, R.D., Jones, R., Weitz, R.R., "An Economic Evaluation of the Central Food Preparation Facility at Fort Lee, Virginia", October 1978, University of Massachusetts, Amherst.

## APPENDIX A

- 2) Giglio, R.D., Davis, R.D., Weitz, R.R., "A Technology to Estimate Work Force Requirements in Military Food Services Facilities", November 6, 1977, University of Massachusetts, Amherst.

## WAGE SCHEDULES

- 3) So, K.H., et al., "Quantitative Analysis of Energy Usage in Central Food Preparation System at Fort Lee, Va.", U.S. Army Medical Research and Development Command.
- 4) Davis, R.D., Jones, R., Weitz, R.R., "An Economic Evaluation of the Central Food Preparation Facility at Fort Lee, Virginia", October 1978, University of Massachusetts, Amherst.



2. TENTATIVE REVISED COMPOSITE STANDARD ARMY RATES FOR COSTING MILITARY  
PERSONNEL SERVICES ARE PROVIDED.

PAGE 3 RUCNFIN0119 UNCLAS

PAY GRADE	ANNUAL	MONTHLY	DAILY
P 10	57292	4774	220
O-9	52876	4406	203
O-8	49085	4090	189
O-7	44057	3671	170
O-6	40342	3362	155
O-5	32873	2740	126
O-4	27089	2258	104
O-3	22305	1859	86
O-2	17378	1448	67
O-1	12746	1062	49
W-4	26121	2176	100
W-3	20881	1740	80
W-2	17332	1444	67
W-1	15137	1262	58
E-9	22320	1860	86
E-8	18516	1543	71
E-7	15810	1317	61
E-6	13161	1096	51
E-5	11078	923	43
E-4	9298	774	36
E-3	8502	709	30
E-2	7849	654	26
E-1	6823	569	22







NS	WL	NG	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10
1			6561.00 3.15	6780.00 3.26	6999.00 3.36	7218.00 3.47	7437.00 3.58	7656.00 3.68	7875.00 3.79	8094.00 3.89	8313.00 4.00	8532.00 4.10
2			7422.00 3.57	7649.00 3.69	7876.00 3.81	8103.00 3.92	8330.00 4.04	8557.00 4.16	8784.00 4.28	9011.00 4.40	9238.00 4.52	9465.00 4.64
3			8366.00 4.02	8645.00 4.16	8924.00 4.29	9203.00 4.42	9482.00 4.56	9761.00 4.68	10040.00 4.81	10319.00 4.94	10598.00 5.06	10877.00 5.19
4			9391.00 4.51	9704.00 4.67	10017.00 4.82	10330.00 4.97	10643.00 5.12	10956.00 5.27	11269.00 5.42	11582.00 5.57	11895.00 5.72	12208.00 5.87
5			10507.00 5.05	10857.00 5.22	11207.00 5.39	11557.00 5.56	11907.00 5.72	12257.00 5.89	12607.00 6.06	12957.00 6.23	13307.00 6.40	13657.00 6.57
		1	10732.00 5.16	11190.40 5.38	11648.80 5.60	12084.80 5.81	12542.40 6.03					
		2	11148.00 5.36	11606.40 5.58	12064.80 5.80	12542.40 6.03	13000.00 6.25					
		3	11564.00 5.55	12022.40 5.78	12480.80 6.01	12979.20 6.24	13457.60 6.47					
6			11712.00 5.63	12102.00 5.82	12492.00 6.01	12892.00 6.19	13272.00 6.38	13662.00 6.57	14052.00 6.76	14442.00 6.94	14832.00 7.13	15222.00 7.32
		1	11814.40 5.68	12313.60 5.92	12812.80 6.16	13291.20 6.39	13790.40 6.63					
		4	11939.20 5.74	12438.40 5.98	12937.60 6.22	13436.80 6.46	13936.00 6.70					
		2	12251.20 5.89	12771.20 6.14	13291.20 6.39	13790.40 6.63	14310.40 6.88					
		5	12336.00 5.93	12854.40 6.18	13374.40 6.43	13873.60 6.67	14393.60 6.92					
		3	12708.00 6.11	13228.80 6.36	13748.80 6.61	14289.60 6.87	14809.60 7.12					
		6	12729.60 6.12	13270.40 6.38	13811.20 6.64	14351.20 6.89	14972.00 7.15					
7			13014.00 6.26	13448.00 6.47	13882.00 6.67	14316.00 6.88	14750.00 7.09	15184.00 7.30	15618.00 7.51	16052.00 7.72	16486.00 7.93	16920.00 8.13
		4	13145.60 6.32	13686.40 6.58	14227.20 6.84	14788.80 7.11	15329.60 7.37					
		7	13166.40 6.33	13707.20 6.59	14248.00 6.85	14809.60 7.12	15350.40 7.38					
		8	13561.60 6.52	14125.20 6.79	14688.80 7.06	15246.40 7.33	15808.00 7.60					
		5	13582.40 6.53	14144.00 6.80	14705.60 7.07	15267.20 7.34	15849.60 7.62					
		9	13956.80 6.71	14539.20 6.99	15121.60 7.27	15704.00 7.55	16286.40 7.83					
		6	14019.20 6.74	14601.60 7.02	15184.00 7.30	15766.40 7.58	16348.80 7.86					
		10	14352.00 6.90	14955.20 7.19	15558.40 7.48	16161.60 7.77	16744.00 8.05					
8			14414.00 6.93	14894.00 7.16	15374.00 7.39	15854.00 7.62	16334.00 7.85	16814.00 8.08	17294.00 8.31	17774.00 8.54	18254.00 8.78	18734.00 9.01
		7	14476.80 6.96	15080.00 7.25	15683.20 7.54	16286.40 7.83	16889.60 8.12					
		11	14747.20 7.09	15371.20 7.39	15995.20 7.69	16598.40 7.98	17222.40 8.28					
		8	14913.60 7.17	15537.60 7.47	16161.60 7.77	16785.60 8.07	17409.60 8.37					
		1	15059.20 7.24	15683.20 7.54	16307.20 7.84	16931.20 8.14	17555.20 8.44					
		12	15163.20 7.29	15787.20 7.59	16411.20 7.89	17035.20 8.20	17659.20 8.50					
		9	15350.40 7.38	15995.20 7.69	16640.00 8.00	17284.80 8.31	17908.80 8.61					
		2	15454.40 7.43	16099.20 7.74	16744.00 8.05	17388.80 8.36	18033.60 8.67					
		13	15558.40 7.48	16203.20 7.79	16848.00 8.10	17492.80 8.41	18137.60 8.72					
		10	15787.20 7.59	16452.80 7.91	17118.40 8.23	17763.20 8.54	18428.80 8.86					
		3	15849.60 7.62	16515.20 7.94	17180.80 8.26	17846.40 8.58	18491.20 8.89					
			15920.00 7.65	16651.00 7.91	17282.00 8.16	17933.00 8.42	18584.00 8.68	18575.00 8.93	19106.00 9.19	19637.00 9.44	20168.00 9.70	20699.00 9.95
		14	15953.60 7.67	16619.20 7.99	17284.80 8.31	17950.40 8.63	18616.00 8.95					
		11	16224.00 7.80	16910.40 8.13	17596.80 8.46	18262.40 8.78	18948.00 9.11					
		4	16224.80 7.81	16931.20 8.14	17617.60 8.47	18283.20 8.79	18969.60 9.12					
		15	16369.60 7.87	17056.00 8.20	17742.40 8.53	18428.80 8.86	19094.40 9.18					
		5	16660.80 8.01	17347.20 8.34	18033.60 8.67	18740.00 9.01	19427.20 9.34					
		12	16661.60 8.02	17368.00 8.35	18054.40 8.69	18761.60 9.02	19448.00 9.35					
		6	17056.00 8.20	17763.20 8.54	18470.40 8.88	19177.60 9.22	19884.80 9.56					
		13	17118.40 8.23	17825.60 8.57	18532.80 8.91	19260.00 9.26	19968.00 9.60					
		7	17472.00 8.40	18200.00 8.75	18928.00 9.10	19656.00 9.45	20384.00 9.80					
10			17532.00 8.43	18116.00 8.71	18700.00 8.99	19284.00 9.27	19868.00 9.55	20452.00 9.83	21036.00 10.11	21620.00 10.39	22204.00 10.64	22788.00 10.96
		14	17555.20 8.44	18283.20 8.79	19011.20 9.14	19739.20 9.49	20467.20 9.84					
		8	17867.20 8.59	18616.00 8.95	19364.80 9.31	20113.60 9.67	20862.40 10.02					
		15	18012.80 8.66	18761.60 9.02	19510.40 9.38	20259.20 9.74	21008.00 10.10					
		9	18262.40 8.78	19032.00 9.15	19801.60 9.52	20550.40 9.88	21320.00 10.25					
		10	18678.40 8.98	19448.00 9.35	20217.60 9.72	21008.00 10.10	21777.60 10.47					
		11	19119.20 9.24	20009.60 9.62	20890.00 10.00	21611.20 10.39	22401.60 10.77					
11			19263.00 9.26	19905.00 9.57	20547.00 9.88	21189.00 10.19	21831.00 10.50	22473.00 10.80	23115.00 11.11	23757.00 11.42	24399.00 11.73	25041.00 12.04
		12	19905.60 9.57	20737.60 9.97	21569.60 10.37	22401.60 10.77	23233.60 11.17					
		13	20779.20 9.99	21652.80 10.41	22526.40 10.83	23399.20 11.24	24252.80 11.66					
		14	21840.00 10.50	22755.20 10.94	23670.40 11.38	24585.60 11.82	25480.00 12.25					
		15	23046.40 11.08	24003.20 11.54	24960.00 12.00	25916.80 12.46	26873.60 12.92					
12			23087.00 11.10	23857.00 11.47	24627.00 11.84	25397.00 12.21	26167.00 12.58	26937.00 12.95	27707.00 13.32	28477.00 13.69	29247.00 14.06	30017.00 14.43
		16	24398.40 11.73	25417.60 12.22	26436.80 12.71	27456.00 13.20	28475.20 13.69					
		17	25037.60 12.47	27019.20 12.99	28100.80 13.51	29182.40 14.03	30264.00 14.55					
13			27453.00 13.20	28368.00 13.64	29283.00 14.08	30198.00 14.52	31113.00 14.96	32028.00 15.40	32943.00 15.84	33858.00 16.28	34773.00 16.72	35688.00 17.16
		18	27664.00 13.30	28608.00 13.85	29552.00 14.40	30496.00 14.95	31440.00 15.51					
		19	29515.20 14.19	30742.40 14.78	31969.60 15.37	33196.80 15.96	34424.00 16.55					
14			32442.00 15.60	33523.00 16.12	34604.00 16.64	35685.00 17.16	36766.00 17.68	37847.00 18.20	38928.00 18.72	40009.00 19.24	41090.00 19.75	42171.00 20.27
		15	38160.00 18.35	39432.00 18.96	40704.00 19.57	41976.00 20.18	43248.00 20.79	44520.00 21.40	45792.00 22.02	47064.00 22.63	48336.00 23.24	49608.00 23.85
16			44756.00 21.52	46248.00 22.23	47740.00 22.95	49232.00 23.67	50724.00 24.39	52216.00 25.10	53708.00 25.82	55200.00 26.54	56692.00 27.26	
17			52429.00 25.21	54177.00 26.05	55925.00 26.89	57673.00 27.73	59421.00 28.57					
18			61449.00 29.54									

\* Rate for this level limited to \$47,500 (Executive Schedule Level V)

Shift Differential  
(NS, WL & NG)  
2nd Shift - 7.50  
3rd Shift - 10.00

GS Employees Night Pay  
(1800-0600)  
10% of basic compensation

Within Grade Increment Time Requirements

Step	NS, WL, NG	GS
Step 2	26 weeks in Step 1	Steps 2, 3, 4
Step 3	78 weeks in Step 2	Steps 5, 6, 7
Step 4	104 weeks in next lower step	Steps 8, 9, 10 - 107 weeks in next lower step



DEPARTMENT OF DEFENSE WAGE FIXING AUTHORITY  
WASHINGTON, D.C. 20310

7 November 1978

SUBJECT: Federal Wage System Regular and Special Production Facilitating Wage Rate Schedules  
for the Wage Area of Seattle-Everett-Tacoma, Washington

TO: Commanding Officers of Military Departments and DoD Component Installations in the Area.

The schedules shown below have been established under authority of DoD Directive 5120.39, "Department of Defense Wage Fixing Authority," 5 June 1968. Rates are established as required by 5 U.S.C. 5343(D), subject to the limitation contained in FPM Bulletin 532-30, 20 October 1978, and are to be applied in accordance with the provisions of FPM Supplement 532-1 to installations listed on the reverse side.

WG WL-WS GRADE	WG-RATES			VL-RATES			WS-WD-WN RATES					WD-WN PAY LEVEL							
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	6	7	8	9
1	6.12	6.37	6.62	6.88	7.13	6.73	7.01	7.29	7.57	7.85	8.62	8.98	9.34	9.70	10.06				
2	6.36	6.63	6.90	7.16	7.43	7.00	7.29	7.58	7.87	8.16	8.86	9.23	9.60	9.97	10.34				
3	6.60	6.88	7.16	7.43	7.71	7.26	7.56	7.86	8.16	8.47	9.10	9.48	9.86	10.24	10.62	1			
4	6.85	7.14	7.43	7.71	8.00	7.55	7.86	8.17	8.49	8.80	9.36	9.75	10.14	10.53	10.92	2			
5	7.10	7.40	7.70	7.99	8.29	7.80	8.13	8.46	8.78	9.11	9.60	10.00	10.40	10.80	11.20	3			
6	7.34	7.65	7.96	8.26	8.57	8.08	8.42	8.76	9.09	9.43	9.84	10.25	10.66	11.07	11.48	4			
7	7.58	7.90	8.22	8.53	8.85	8.34	8.69	9.04	9.39	9.73	10.09	10.51	10.93	11.35	11.77	5	1		
8	7.84	8.17	8.50	8.82	9.15	8.62	8.98	9.34	9.70	10.06	10.34	10.77	11.20	11.63	12.06	6	2		
9	8.08	8.42	8.76	9.09	9.43	8.99	9.26	9.63	10.00	10.37	10.58	11.02	11.46	11.90	12.34	7	3		
10	8.32	8.67	9.02	9.36	9.71	9.16	9.54	9.92	10.30	10.68	10.83	11.28	11.73	12.18	12.63	8	4		
11	8.57	8.93	9.29	9.64	10.00	9.43	9.82	10.21	10.61	11.00	11.03	11.49	11.95	12.41	12.87	9	5		
12	8.81	9.18	9.55	9.91	10.28	9.70	10.10	10.50	10.91	11.31	11.30	11.77	12.24	12.71	13.18	10	6		
13	9.06	9.44	9.82	10.20	10.57	9.97	10.39	10.81	11.22	11.64	11.64	12.12	12.60	13.09	13.57	11	7		
14	9.31	9.70	10.09	10.48	10.86	10.24	10.67	11.10	11.52	11.95	12.03	12.53	13.03	13.53	14.03	12	8		
15	9.55	9.95	10.35	10.75	11.14	10.50	10.94	11.38	11.82	12.25	12.50	13.02	13.54	14.06	14.58	13	9		

WS-16 13.02 13.56 14.10 14.64 15.19  
WS-17 13.60 14.17 14.74 15.30 15.87  
WS-18 14.26 14.85 15.44 16.04 16.63  
WS-19 14.98 15.60 16.22 16.85 17.47

*Handwritten signature*

HEVE J. FOREST  
Chief, Technical Staff

Effective Date: 5 November 1978



# DEPARTMENT OF THE ARMY

FINANCE & ACCOUNTING OFFICE  
U. S. ARMY ARMOR CENTER  
FORT KNOX, KENTUCKY 40121

## OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE, \$300

## WAGE SCHEDULES

WG-ML GRADE	WG RATES					WS GRADE	WD-WIN PAY LEVEL	WS-WD-WIN RATES				
	1	2	3	4	5			1	2	3	4	5
1	5.06	5.27	5.46	5.69	5.90			7.26	7.56	7.86	8.16	8.47
2	5.31	5.53	5.75	5.97	6.19	1	1	7.51	7.82	8.13	8.45	8.76
3	5.56	5.79	6.02	6.25	6.48	2	2	7.76	8.08	8.40	8.73	9.05
4	5.81	6.05	6.29	6.53	6.78	3	3	8.01	8.34	8.67	9.01	9.34
5	6.06	6.31	6.56	6.81	7.07	4	4	8.26	8.60	8.94	9.29	9.63
6	6.31	6.57	6.83	7.10	7.36	5	5	8.51	8.86	9.21	9.57	9.92
7	6.56	6.83	7.10	7.38	7.65	6	6	8.76	9.12	9.48	9.85	10.21
8	6.81	7.09	7.37	7.65	7.94	7	7	9.00	9.38	9.76	10.13	10.51
9	7.07	7.36	7.65	7.95	8.24	8	8	9.26	9.65	10.04	10.42	10.81
10	7.32	7.62	7.92	8.23	8.53	9	9	9.51	9.91	10.31	10.70	11.10
11	7.56	7.88	8.20	8.51	8.83	10	10	9.74	10.15	10.56	10.96	11.37
12	7.81	8.14	8.47	8.79	9.12	11	11	10.00	10.42	10.83	11.23	11.63
13	8.06	8.40	8.74	9.07	9.41	12	12	10.26	10.68	11.09	11.49	11.89
14	8.31	8.66	9.01	9.35	9.70	13	13	10.51	10.93	11.34	11.74	12.14
15	8.56	8.92	9.28	9.63	9.99	14	14	10.76	11.18	11.59	11.99	12.39
						15	15	11.01	11.43	11.84	12.24	12.64
						16	16	11.26	11.68	12.09	12.49	12.89
						17	17	11.51	11.93	12.34	12.74	13.14
						18	18	11.76	12.18	12.59	12.99	13.39
						19	19	12.01	12.43	12.84	13.24	13.64

Effective 23 April 1978



# APPENDIX B

## AREA REQUIREMENTS



DALO-TAE-D

15 March 1979

## MEMORANDUM FOR RECORD

SUBJECT: Ingredient Preparation Area Square Footage

1. The following is maximum square footage estimated as required for Ingredient Preparation Area, without CFPF.

AREA	FORT LEE CURRENT	REQUIRED	FT CARSON	FT LEWIS	FT KNOX
Admin (1)	844	600	600	700	700
Vegetable Washing & Peeling (3)	833	600	600	600	600
Vegetable/Salad Preparation (4)	1666	1500	1500	1600	1600
Meat Preparation (4)	781	800	800	800	900
Chill Storage (2)	1013	800	800	1000	1200
Dry Ingredient Scaling/Storage (3)	393	200	200	200	200
Other (Sandwich Room & Pilot Kitchen) (5)	1038	-	-	-	-
	6568	4500	4500	4900	5200

## NOTES:

(1) Administrative Area includes office, employee locker, break and rest rooms, boiler room and supply room (no refrigeration requirement).

(2) Chill storage should be at about 40°F. TISA storage could be used, if close by and sufficient space is available, thus negating the requirement for this area.

(3) Ingredient storage and vegetable washing and peeling areas would not require refrigeration.



DALO-TAE-D

15 March 1979

SUBJECT: Ingredient Preparation Area Square Footage

(4) Vegetable/Salad Preparation and meat preparation areas should be air conditioned/refrigerated to a constant temperature of about 55°F.

(5) Sandwich preparation (currently freezer room) and Pilot Kitchen areas of Fort Lee are not required for ingredient preparation operations.

2. The above are preliminary maximum estimated ingredient preparation area requirements. The actual space may vary considerably depending on the facility available and items produced.

JAMES E. TURNER

LTC, GS

Chief, Systems Development Division  
Concepts and Systems Directorate

COORDINATION:

\_\_\_\_\_  
Dir., Dir. of Fd. Mgt., Ft. Lee      DATE

\_\_\_\_\_  
Veterinary Staff Office, TSA      DATE



# APPENDIX C

## DF STAFFING REQUIREMENTS, ACTIVITY CLASSIFICATIONS AND DF SERVICE LEVELS



Previously collected work sampling data are utilized to determine dining facilities staff savings for an IPF system.

Worker activity classifications used during the data collection are given in Table C.1. Service level characteristics vis a vis average number of meals served are given in Table C.2. The sampling information allows determination of work force requirements as they vary over the course of a day. The data have been aggregated to treat weekdays and weekends separately.

Daily worker schedules are determined at each facility, for cooks and KPs, weekdays and weekends, for the following three situations:

CASE 1--dining facility staffing for a conventional system

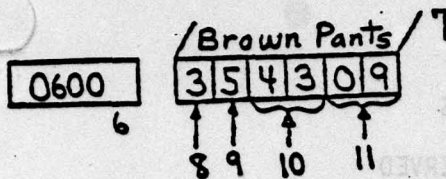
CASE 2--dining facility staffing assuming an IPF that performs vegetable preparation, salad preparation, and sandwich preparation (activities 11, 15 and 17).

CASE 3--dining facility staffing assuming an IPF that performs in addition to those functions listed in CASE 2, meat preparation, soup preparation, and dessert preparation (activities 10, 14 and 16).

In turn, from the daily worker schedules for each of the above situations at each base, the minimum number of workers required, assuming a five-day work week, may be determined. This information is given in Table C.3. In all cases a feasible schedule using the minimum number of workers is possible.



TABLE C.1



6. Military time of the observation
7. Specific employee identification
8. Job classification code (refer to Appendix B, 1 digit)
9. Department code (refer to Appendix C, 1 digit)
10. Activity code (refer to Appendix D, 2 digits)
11. Pace rating factor (2 digits) Appendix E

## PACE RATING FACTOR

PACE RATING - A technique by which an analyst compares the performance (speed or pace) of the worker under observation with the observer's own concept of normal performance.

Performance (%)	Pace Factor (2 digits)
120	12
110	11
NORMAL 100	10
PERFORMANCE 90	09
80	08
70	07

Code	Activity Listing
01	Idle
02	Absent from assigned work station
03	Walking loaded
04	Walking empty
05	Designated rest break
06	Miscellaneous work
07	Personal hygiene
10	*Prepares meats for cooking
11	*Prepares vegetables for cooking
12	Cooks food off line
13	Cooks food on line
14	*Prepares soups
15	*Prepare and assemble salads
16	*Prepare and assemble desserts
17	*Prepare and assemble cold sandwiches
18	Prepares cooking utensils
19	*Prepares for baking
20	Bakes
21	Set up serving line
22	Replenish or close serving line
23	Serves customers
24	Serving--being at attention to the serving process
31	Wash utensils and pots
32	Cleans equipment
33	Cleans kitchen
34	Cleans dining area and tables
35	Clean dishwashing area
41	Clear tables
42	Set up tables
43	Operates dishwasher--wash silverware and dishes
44	Stack silverware and dishes
51	Receive supplies
52	Order supplies
53	Issue supplies
61	Prepares correspondence and records
62	Telephone
71	Monitors report and OJT program
72	Inspects
73	Receives or gives supervision
83	Collect cash & conduct headcount
91	OJT
92	Maintenance/repair

\*Indicate in the blank space to the right of the data column  
 /--if the preparation is for meals following the next scheduled meal on the same day  
 X--if the preparation is for meals on subsequent days  
 NO indication implies preparation is for the next meal

## JOB CLASSIFICATIONS

1. DINING HALL SUPERVISOR: The E-7 or E-6 military supervisor in charge of the operation of the dining hall.
2. MILITARY COOK: The E-4, E-3, or E-2 military person who performs administrative and/or cooking functions in the dining hall.
3. CIVILIAN SHIFT LEADER: The WL-8 civilian responsible for assigning work to other civilians on his shift, or who performs actual cooking function.
4. CIVILIAN COOK: The WG-8 civilian who performs actual cooking functions in the dining hall.
5. CIVILIAN FOOD SERVICE WORKER: The WG-2 civilian who performs cleaning, dishwashing, and other related functions in the dining hall.
6. BAKER: The WG-8 civilian who performs baking functions in the pastry kitchen.
- OJT: The military person categorized as an on the job trainee.

Code	Department
1	Office
2	Meat and vegetable cooking
3	Salad
4	Bakery
5	Dishroom
6	Pot washing
7	Storeroom
8	Serving line
9	Dining



TABLE C.2  
DINING HALL CHARACTERISTICS

## AVERAGE NUMBER OF MEALS SERVED

DINING FACILITY	BREAKFAST		LUNCH		DINNER		MIDNIGHT	
	WEEKDAYS	WEEKENDS	WEEKDAYS	WEEKENDS	WEEKDAYS	WEEKENDS	WEEKDAYS	WEEKENDS
Main	280	190	480	---	380	445	100	80
#649	280	165	450	190	375	200	---	---
#694	225	115	370	160	265	160	---	---
Ney Hall	925	560	1000	670	780	730	---	---

DINING FACILITY	SEATING CAPACITY	SHORT ORDER	BUSSING
Main	350	YES LUNCH WEEKDAYS	KP
#649	300	YES LUNCH WEEKDAYS	PATRON
#694	300	YES LUNCH WEEKDAYS	PATRON
Ney Hall	500	YES LUNCH WEEKDAYS AND WEEKENDS	PATRON



TABLE C.3

PEASE

347 Rations Per Day

COOKS

MIN. # PEOPLE

DAILY REQUIREMENTS

REQUIRED FOR 5 DAY

	<u>WEEKDAYS</u>	<u>WEEKENDS</u>	<u>WORK WEEK</u>
CASE 1	6	5	8
CASE 2	6	4	8
CASE 3	6	3	8

KP

MIN. # PEOPLE

DAILY REQUIREMENTS

REQUIRED FOR 5 DAY

	<u>WEEKDAYS</u>	<u>WEEKENDS</u>	<u>WORK WEEK</u>
CASE 1	6	5	8
CASE 2	6	5	8
CASE 3	6	4	8

TOTAL NO. OF WORKERS REQUIRED  
FOR FIVE DAY WORK WEEK:

CASE 1	16
CASE 2	16
CASE 3	16



TABLE C.3 (CONT.)

DEVENS 649

330 Rations Per Day

COOKSDAILY REQUIREMENTS

MIN. # PEOPLE

REQUIRED FOR 5 DAY

	<u>WEEKDAYS</u>	<u>WEEKENDS</u>	<u>WORK WEEK</u>
CASE 1	12	7	15
CASE 2	11	7	14
CASE 3	10	6	13

KP

MIN. # PEOPLE

DAILY REQUIREMENTS

REQUIRED FOR 5 DAY

	<u>WEEKDAYS</u>	<u>WEEKENDS</u>	<u>WORK WEEK</u>
CASE 1	11	7	14
CASE 2	11	7	14
CASE 3	11	7	14

TOTAL NO. OF WORKERS REQUIRED  
FOR FIVE DAY WORK WEEK:

CASE 1	29
CASE 2	28
CASE 3	27



TABLE C.3 (CONT.)

DEVENS 694

257 Rations Per Day

COOKS

MIN. # PEOPLE

DAILY REQUIREMENTS

REQUIRED FOR 5 DAY

	<u>WEEKDAYS</u>	<u>WEEKENDS</u>	<u>WORK WEEK</u>
CASE 1	10	7	13
CASE 2	10	6	13
CASE 3	10	6	13

KP

MIN. # PEOPLE

DAILY REQUIREMENTS

REQUIRED FOR 5 DAY

	<u>WEEKDAYS</u>	<u>WEEKENDS</u>	<u>WORK WEEK</u>
CASE 1	10	6	13
CASE 2	10	6	13
CASE 3	10	6	13

TOTAL NO. OF WORKERS REQUIRED  
FOR FIVE DAY WORK WEEK:

CASE 1	26
CASE 2	26
CASE 3	26



TABLE C.3(CONT.)

NEWPORT

833 Rations Per day

COOKS

MIN. # PEOPLE

DAILY REQUIREMENTS

REQUIRED FOR 5 DAY

	<u>WEEKDAYS</u>	<u>WEEKENDS</u>	<u>WORK WEEK</u>
CASE 1	8	6	11
CASE 2	8	6	11
CASE 3	6	4	8

KP

MIN. # PEOPLE

DAILY REQUIREMENTS

REQUIRED FOR 5 DAY

	<u>WEEKDAYS</u>	<u>WEEKENDS</u>	<u>WORK WEEK</u>
CASE 1	23	25	33
CASE 2	22	23	32
CASE 3	22	23	32

TOTAL NO. OF WORKERS REQUIRED  
FOR FIVE DAY WORK WEEK:

CASE 1	44
CASE 2	43
CASE 3	40



DISTRIBUTION LIST

HQDA (DALO-TST) WASH DC 20310	1 + 2
HQDA (DASG-VC) WASH DC 20310	1
HQDA (DASG-DBD) WASH DC 20310	1
HQDA (DAMA-CSS) WASH DC 20310	1
HQDA (DAEN-MCE-A) WASH DC 20310	1
Commander US Army Forces Command ATTN: AFLG-TRS Fort McPherson, GA 30330	1
Commander US Army Training and Doctrine Command ATTN: ATLG-SVC Fort Monroe, VA 23351	1
Commander US Army Development and Readiness Command ATTN: DRCISS 5001 Eisenhower Avenue Alexandria, VA 22333	2 + 3
Commander US Army Quartermaster Center and Fort Lee ATTN: ATZM-DI-SS Fort Lee, VA 23801	3
Commander US Army Troop Support and Aviation and Materiel Readiness Command 4300 Goodfellow Blvd. St. Louis, MO 63120	1



DISTRIBUTION LIST (CONT'D)

Commander US Army Natick Research and Development Command ATTN: DRDNA-O, DRDNA-ZF, DRDNA-WTA Natick, MA 01760	3
Commander US Army Walter Reed Medical Center Washington, DC 20012	1
Commander US Army Communications Command ATTN: ACC-LOG-TS Fort Huachuca, AZ 85613	1
Commander US Army Logistics Center Fort Lee, VA 23801	1
Commander Letterman Army Institute of Research Presidio, San Francisco, CA 94129	1
Commander US Army Defense Personnel Support Center 2800 South 20th Street Philadelphia, PA 19101	1
Commandant US Army Quartermaster School Fort Lee, VA 23801	1
Commandant US Army Logistics Management Center Fort Lee, VA 23801	1
Commandant US Army Logistics Management Center ATTN: Defense Logistics Studies Information Fort Lee, VA 23801	1
Administrator Defense Logistics Agency Defense Technical Information Center ATTN: DTIC-DD Cameron Station Alexandria, VA 22314	1



DISTRIBUTION LIST (CONT'D)

Commander US Army Foreign Science and Technology Center ATTN: Mrs. Vicki Dibbern 220 7th Street, NE Charlottesville, VA 22901	1
Headquarters Air Force Engineering and Services Center ATTN: DEHF Tyndal Air Force Base, FL 32403	1
Commander HQ, Air Force Logistics Command ATTN: ALLC/DPSB Wright Patterson AFB, OH 45433	1
Commander Navy Food Service Systems Office Bldg. 166, 2nd Deck Washington Navy Yard WASH DC 20390	1
Commandant HQ, US Marine Corps ATTN: LFS-4 WASH DC 20380	1